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**UNITED STATES
DEPARTMENT OF AGRICULTURE**

ARTHUR M. HYDE
Secretary

**YEARBOOK OF
AGRICULTURE
1930**

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FOREWORD

THIS Yearbook of Agriculture, like those issued for the three preceding years, assembles a great variety of recent scientific, technical, and economic information in short, popularly written articles and in agricultural maps and statistical tables. It is a comprehensive chronicle of contemporary progress in agricultural science and practice. Its primary object is to facilitate practical application of the continually increasing fund of scientific knowledge. (Covering so wide a field, it necessarily deals with many subjects in broad outline rather than in minute detail; but the gain seems worth the sacrifice. The reader gets here what he can get nowhere else, namely, a glance at what is going on in all branches of agricultural research and farm technique. Other publications issued by the Department of Agriculture go exhaustively into specialized subject matter. This one alone gives a general picture of the agricultural industry in all its principal phases. Furthermore, the book furnishes a prompt outlet for much valuable new knowledge the publication of which might otherwise be long delayed.) (Farmers, for whom the book is primarily intended, will recognize that they can get more detailed information through the extension service or by writing to the department. Research workers and technicians likewise will have no difficulty in supplementing the information herein contained with more detailed data from other sources. (Though brief, the Yearbook articles do not lack scientific authority and precision. All the contributors are members of the department, expert in their respective fields; and the facts and conclusions reported have in every case been reviewed by many different specialists. It is worth noting incidentally that the writers have expressed complex and difficult matter in a simple and readable manner.) (As usual, the Annual Report of the Secretary of Agriculture to the President is included. Previous Yearbooks in this series have proved very popular. I am confident that this one will have an equally wide appeal.

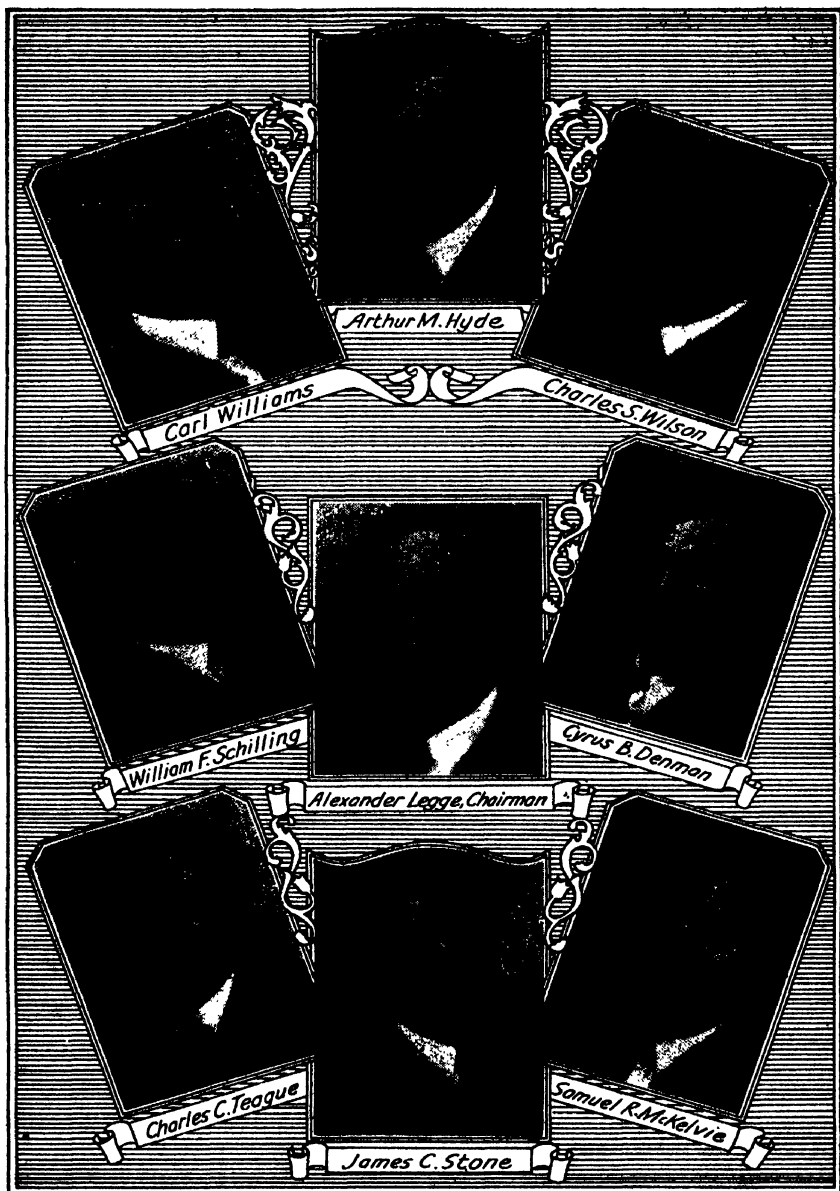
ARTHUR M. HYDE,
Secretary of Agriculture.

MARCH 1, 1930.

Beginning with this 1930 issue, the Yearbook of Agriculture, in conformity with the practice generally followed in the publication of yearbooks, is designated by the year in which it is printed rather than by the year surveyed. Thus the present volume surveys agricultural conditions in 1929. The new system of dating more truly indicates the strictly up-to-date character of the volume. This procedure does not break the continuity of the statistical and other material published, nor does it involve any omission in the Yearbook series.

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THE FEDERAL FARM BOARD

The Federal Farm Board appointed by President Hoover under the agricultural marketing act of June 15, 1929. Arthur M. Hyde, Secretary of Agriculture, is a member of the board ex officio. The other members are: Alexander Legge, of Illinois, chairman, formerly president of the International Harvester Co.; James C. Stone, of Kentucky, vice chairman, formerly president of the Burley Tobacco Growers Cooperative Association, representing tobacco; Carl Williams, of Oklahoma City, editor of the Oklahoma Farmer-Stockman, representing cotton; C. B. Denman, of Missouri, formerly president of the National Livestock Producers Association, representing livestock; Charles C. Teague, of California, formerly president of the California Fruit Growers Exchange and the Walnut Growers Cooperative Association of California, representing fruits and vegetables; William F. Schilling, of Minnesota, formerly president of the Twin City Milk Producers Association, representing dairy products; Charles S. Wilson of New York, formerly commissioner of agriculture in New York, representing fruits and vegetables; Samuel R. McKelvie, of Nebraska, publisher of the Nebraska Farmer, representing grain.



THE YEAR IN AGRICULTURE

THE SECRETARY'S
REPORT TO THE
PRESIDENT

WASHINGTON, D. C., *November 15, 1929.*

To the PRESIDENT:

Widespread drought during the growing season of 1929 dried up pastures and reduced crop yields below those of any recent year. The losses in production, however, were so evenly distributed for the country as a whole that no large area had either very bountiful or very short crops. Moreover, from the standpoint of the producers, reduced yields seemed likely to be more than offset by price advances. It is probable that the total income from agricultural production for the 1929-30 crop year will equal, if it does not exceed, that of the 1928-29 season.

Cool spring weather, with heavy rains, delayed planting in many sections of the West and Northwest. Planting was exceptionally backward in the States from Ohio to Missouri, where some corn was not put in the ground until July. Rainfall was light and spotty during the early summer, especially in the northern half of the country. A general drought developed during August, except in the far Southwest. Conditions improved somewhat during September, and some crops turned out rather better than had been expected.

Growers planted a total acreage about equal to that of 1928. Yields were disappointing in practically all crops, except irrigated crops and some varieties of hay. The hay crops that turned out well made heavy growth before the drought became severe. All crops combined gave a yield per acre 7.4 per cent below that of 1928 and 4.1 per cent below the average for the preceding 10 years. Lower than average yields were experienced in 29 States. The western Great Plains suffered most from the drought. Yields were reduced along the Atlantic coast from Massachusetts to North Carolina and in all the North Central States except Wisconsin. California and Washington suffered from drought during the winter of 1928-29, and California fruits were injured by a severe freeze in April. The late spring reduced yields somewhat in the other fruit-producing areas, except the apple-producing sections of Virginia and West Virginia.

Reduced Yields in Corn

Corn production was 2,528,000,000 bushels, or 308,000,000 bushels less than in 1928. With the exception of the crop of 1924, this year's corn crop is the smallest since 1918. The acreage in corn was smaller than in 1917; but reduced yields were the principal cause of the

reduced production. New England, New York, and the Southern States east of the Mississippi River produced more corn than in 1928. Corn production in the northern part of the Corn Belt was not materially below that of the previous year. The yields were reduced most in the area just north of the Ohio River, in Missouri, in Kansas, and in the far Southwest. The production of grain sorghums, which supplement corn for feed in the southwestern area, totaled only 93,000,000 bushels, as compared with 142,000,000 bushels in 1928 and an average of 128,000,000 bushels for the past five years.

Wheat production, winter and spring varieties combined, totaled about 792,000,000 bushels, as compared with 902,000,000 bushels in 1928. This output was between 4 and 5 per cent less than the annual average for the previous five years, though the harvested acreage was about 9 per cent larger. The greatest decline was in spring wheat, the production of which was only 224,000,000 bushels, as compared with 324,000,000 bushels in 1928. Durum wheat production was only 53,000,000 bushels, against 93,000,000 bushels in the previous year. The acreage in durum wheat was only 80 per cent of the 1928 acreage. Production of winter wheat was about 10,000,000 bushels less than in 1928, though the acreage harvested was 10 per cent greater. The hard winter wheat crop in the western Great Plains was reduced materially. Soft winter wheat production, however, was somewhat above the unusually small crop of 1928 and nearly equal to the average for the previous five years.

Oats Production Below 5-Year Average

Oats production was about 120,000,000 bushels less than the average for the preceding five years, and barley production was 104,000,000 bushels above that average. Output of both crops was smaller than in 1928. Their production was fairly well distributed over the country. Flax production was only 16,600,000 bushels, as compared with 18,700,000 bushels in 1928 and an average of 23,200,000 bushels for the preceding five years. Acreage seeded to flax was 17 per cent greater than in 1928, but yields were greatly reduced by frosts early in the year and by drought early in the summer. The yield per acre averaged only 5.4 bushels, the lowest since the unusually dry year, 1919.

Cotton production, according to the October estimate, was 14,915,000 bales, as compared with 14,478,000 bales ginned last year. This output was grown on an acreage only slightly below the record acreage of 1926. Yields, however, were greatly reduced by drought in Oklahoma and in much of Texas. The eastern part of the Cotton Belt had about an average yield. In that section heavy weevil infestation in the fall of 1928 and a mild winter in 1928-29 threatened heavy losses from the boll weevil. The dry summer, however, helped to control the insect. Potato production was about 345,000,000 bushels, as compared with the excessive production of 454,000,000 bushels in 1928. Drought and excessive heat in many States were unfavorable to the crop. In the Northern States rains in early September were so closely followed by frosts that the crop could not recover. Yields of potatoes were light everywhere, except in northern New England and a few of the Western States. The acreage planted to potatoes was very close to the average for recent

years. It seems probable that the reduced potato crop will bring the farmers considerably more than last year's heavy crop brought them. Should present prices prevail for the marketing season, the income from potatoes will be approximately 75 per cent greater than in 1928.

Tobacco production was above that of 1928 and above the average for the preceding five years. This crop was planted on an acreage nearly 6 per cent greater than that in the previous year, and yields were about the same. Moreover, the quality of the crop is better, while prices for most kinds are at least equal to those of last year. Hay production was rather unevenly distributed, though the yield for the country as a whole was about the average, and acreage also was about the average. The crop was unusually good in the North Central States east of the Mississippi River and also west into Missouri, Iowa, and most of Nebraska. West of these States in a semi-circular area extending from Arkansas through Oklahoma and Texas and parts of Kansas and Colorado into the Dakotas, hay production was sharply reduced. It was light also in most of the Northwest. Fruit production was generally low. The apple crop was reduced in some of the Northern States by dry weather. The Southern peach crop suffered from unfavorable weather at blooming time and from rain during the harvesting period. Citrus fruits in Florida suffered from drought in the winter of 1928-29 and bloomed only lightly in the spring. As already noted, deciduous fruits in California were damaged by a freeze in April. Yields of tree and vine fruits averaged about one-fourth less than in 1928.

WHEAT

Though this season's wheat crop is considerably smaller than that of 1928, it may return the growers a larger income. Wheat prices have been substantially higher so far this season than they were during the corresponding period of the 1928-29 season. A reduction in our wheat output is offset by an increase in the carry-over from the previous season. Stocks on July 1 totaled 245,000,000 bushels compared with 128,000,000 bushels on the same date in 1928. Income from wheat depends, however, on the world wheat situation as well as on the situation in the United States. The world's production of wheat outside Russia and China in 1929, according to the reports now available, is about 3,400,000,000 bushels, or 500,000,000 bushels less than the record crop of 1928. As the carry-over was larger than that of the previous crop year, the total world supply for 1929-30 is only about 360,000,000 bushels less than the supply available in 1928-29. Nevertheless, the indicated reduction has raised the world price level. It seems probable that the average price for the year to United States growers will be better than the average for 1927-28.

Returns from wheat farming in recent years illustrate the familiar fact that it is not always the largest crop that brings the greatest cash return. Our wheat production in 1927 was 878,000,000 bushels. The 1928 crop was 902,000,000 bushels. Wheat marketed from the 1927 United States crop was sold at an average price at the farm of \$1.19 a bushel, and brought the farmers a cash income of \$962,000,000. Wheat marketed from the 1928 crop was sold at an average

price of only \$1 a bushel, and brought in a cash income of only \$753,000,000. The difference in the returns from wheat in these two seasons was largely the result of a great increase in the world crop. World production outside Russia and China in 1928 was about 3,900,000,000 bushels, or 250,000,000 bushels more than in 1927.

Producers' Intentions to Plant

Winter wheat producers' plans for the 1930 crop, as expressed in intentions to plant reports, contemplated a wheat acreage 1.2 per cent greater than that seeded in the fall of 1928. Such an acreage, with average abandonment and average yields, would increase our exportable surplus of the 1930 crop and increase the dependence of the producers on the foreign market. The world market for wheat of the 1930 crop probably will be no better and may not be as good as the world market for the present season. Keen foreign competition is in prospect. Russia may again be a factor in the world's wheat market in a few years, and Canada, Australia, and Argentina are vigorous competitors of the United States. The principal wheat-exporting countries show a general tendency to expand their wheat acreage. It seems doubtful, in short, if the supplies of wheat in the world's markets during the next few years will average much under the levels for the past six years, unless an unusual combination of circumstances should give a series of low yields.

COTTON

In the 1928-29 season cotton producers received a lower price per pound, but for a larger crop they received about the same amount of cash as in the previous season. On an increased acreage they harvested 14,478,000 bales. Yields for the Cotton Belt as a whole were 3 pounds per acre below the 10-year average. In the Atlantic Coast States yields were still lower. This region had disastrous storms shortly after picking began. In many counties of the coastal plain the damage was so great that seed loans from the Federal Government were necessary for the planting of the new crop. Although production in 1928 was 1,500,000 bales greater than in 1927, the world carry-over of American cotton was greatly reduced. In consequence the total supply available for the season was only about 19,600,000 bales, as compared with 20,800,000 bales for 1927-28.

The domestic consumption of cotton was low at the beginning of the 1928-29 season but soon increased. The total for the season amounted to 7,091,000 bales, or 257,000 bales more than in the 1927-28 season. The opposite situation prevailed in the export market. Exports were large early in the season, but declined rapidly after December because of a less active European demand. As a result, despite a material reduction in foreign stocks at the beginning of the season, and lower cotton prices, Europe took practically no more American cotton than in the 1927-28 season. Japan, however, took nearly one-half million bales more. The world's consumption of American cotton in the 1928-29 season amounted to about 15,076,000 bales. The world's carry-over of American cotton at the end of the season was about 4,500,000 bales.

The 1928-29 cotton marketing season was characterized by the most stable prices which have existed in any year since the World War. The total range in the spot markets was only about $3\frac{1}{2}$ cents a pound. Prices were mostly within a range of $1\frac{1}{2}$ cents. For the season August 1, 1928, to July 31, 1929, Middling cotton at the 10 spot markets averaged 18.67 cents a pound, or about 1 cent a pound less than the price for the previous year. At the beginning of the 1929-30 season the world's supply of American cotton was approximately the same as at the beginning of the previous season. An increase of slightly more than 400,000 bales in the production was offset by a decrease of about 600,000 bales in the carry-over. This left a total supply for the season of about 19,400,000 bales, compared with 19,600,000 bales in the 1928-29 season. For the first two months of the current season cotton prices averaged slightly above the average for the corresponding two months of the previous season but slightly below the average for the entire 1928-29 season.

Elements of Quality in Cotton

It is important that the elements of quality in cotton be better recognized. This is a complex problem. Cotton is not a homogeneous thing but a mass of individual fibers. The department is studying the relationships that exist between the properties of the fibers and the qualities of the products into which they enter. Studies are also under way, in cooperation with the States, as to the relationship between prices paid to growers and the quality of the cotton sold. A buying system by which cotton of all qualities is bought at an average price penalizes the producer of better-quality cotton and gives an undeserved premium to the producer of inferior cotton. Study of these practices should suggest means of improvement.

In the 1928-29 season the department for the first time obtained and published information as to the number of bales of cotton of each grade and staple produced, carried over, and consumed in the United States. The production of cotton having a staple length of seven-eighths of an inch and under, and of cotton $1\frac{1}{8}$ inches and over, was apparently ample, but cotton of 1 inch and $1\frac{1}{4}$ inches was relatively scarce. Our production would apparently better fit the demand in this country if less very short-staple cotton and more cotton in the range from 1 inch to $1\frac{1}{4}$ inches were grown.

Selection of cotton for manufacturing becomes more discriminat-ing each year. If American growers are to improve or even to hold their present position in the world's market, more thought must be given to producing the better qualities of cotton that are most in demand. Information now gathered permits estimates of the quality of production to be made for the United States as a whole and for individual States, but not for smaller areas. It is desirable to intensify the work, so that grade and staple reports may be made for counties. Such reports would mean much to individual growers, and would facilitate improvement through community action. They would particularly emphasize the advantages of the single-variety community plan, which may hold more promise of improvement in the production of good-quality cotton than any other single action.

Moreover, the single-variety community plan offers the best foundation for community organization in merchandising.

LIVESTOCK

Further improvement was made by the livestock industry in 1929, though favorable trends were not as sharply defined as in 1928. Certain branches of the industry showed losses, but gross returns to livestock producers in the first eight months of the year were approximately \$93,000,000 more than in the corresponding period of 1928. Figures showing net returns are not available, but undoubtedly the current year has been profitable for the livestock industry on the whole. Gain in gross income was effected despite a decrease of 1,187,000 head of meat animals slaughtered under Federal inspection in the first eight months of the year as compared with the number slaughtered in the corresponding period of 1928. The increased return from a reduced volume of sales was partly the result of higher average prices and partly of a higher average weight in the animals slaughtered.

Though cattlemen generally have prospered this year, some who fed cattle during the fall and winter of 1928 suffered losses. In the first three months of 1929 a slump occurred in fed-cattle prices. This reacted unfavorably on the demand for feeder cattle during the summer and the early fall. As a result, feeder-cattle prices declined sharply. On September 15 the prices of such cattle at Chicago were nearly \$2 a hundred pounds below the prices of the year before. However, the average price of slaughter cattle in the first eight months of 1929 was 23 cents a hundred pounds higher than in the corresponding period of 1928 and \$2.54 a hundred pounds higher than in the corresponding period of 1927.

Though 2.5 per cent fewer cattle were slaughtered during the first eight months of 1929 than in the first eight months of 1928, the gross return to producers was \$3,700,000 more, due to higher prices and increased average weights. Returns from calf slaughter have increased from the same causes. Indications are that the total marketings of cattle and calves for the full year 1929 will be somewhat less than in 1928 and will make the smallest total since 1921. Yet the prospect is for an increase in gross returns. During the last year high prices for cattle have attracted larger shipments of dried beef from Argentina and of fresh beef from New Zealand to this country.

Hog Slaughter Smaller

Hog slaughter likewise was smaller during the first eight months of 1929 than in the corresponding period of 1928. The decrease was about 4 per cent. Average weights of the animals slaughtered, however, were considerably higher, and average prices for the period showed an advance of \$1.24 a hundred pounds. Hence producers received nearly \$81,250,000 more than in 1928. In general the first three-fourths of the year was marked by constancy in supplies and prices. Toward fall, receipts of hogs at public stockyards increased materially, and prices declined. Average prices at Chicago in the middle of September were about \$1.70 a hundred pounds lower than

at the July peak, and nearly \$3 a hundred pounds lower than in September, 1928.

The foreign demand for pork products has been strong in the last few months because of reduced production in several countries of northern Europe. These countries now show a tendency to increase their hog production. The pork-production cycle of northern Europe tends to coincide with that of the United States. It is therefore probable that American pork in northern European markets will meet increased competition within the next year and a half. Demand for hog products continues strong in the United States as well as in foreign countries. In the United States the strong demand is partly the result of the prevailing high prices for other meats and partly of favorable general business conditions. The demand for lard, however, has been adversely affected of late by the low prices of competing vegetable oils. The outlook for the coming winter and spring is for higher average hog prices than those of the preceding winter and spring. But if producers react as they have done formerly to similar price situations, farrowings next spring will increase. This, together with prospective European increases, will tend to start prices on the downward swing of the cycle during the latter part of 1930.

Record Returns from Sheep

Sheep producers, unlike the producers of cattle and swine, marketed an increased number of animals in the first eight months of 1929, as compared with the number marketed during the corresponding period of the previous year. In that period receipts of sheep and lambs at public markets were 6 per cent greater than in the first eight months of 1928. Federally inspected slaughter increased about 6½ per cent. This increase was happily accompanied by an increase in the gross money return to producers. It is estimated that this increase was nearly \$7,000,000, or 7 per cent over the return during the corresponding period of 1928. A high level of beef prices helped to increase the demand for lamb and mutton. Also, the producers' campaign for increased lamb and mutton consumption was apparently effective in increasing the demand for lamb and mutton.

On the whole, the lamb market was steadier than it had been for several years, and marketings and prices followed normal seasonal trends more closely than was the case with either cattle or hogs. However, the increase in lamb and mutton prices which made possible the improvement in gross returns occurred during the first four months of the year. When the new-crop lambs came to market, the earlier price levels could not be maintained. Market supplies of sheep and lambs from April to August were 9 per cent greater than in the corresponding period of 1928, and 33 per cent greater than in the corresponding period of 1924. They constituted a record run for the period. As a result, the average price of sheep and lambs slaughtered in August was \$1.15 a hundred pounds under the average price in August, 1928, which decrease was offset by the increased number of sheep and lambs that producers had to sell. Probably the gross returns of the sheep industry for 1929 will exceed those for any previous year in its history.

Wool producers have felt the effect of increased foreign competition recently. In June, 1929, the average price received for wool by the farmers of the United States was 30.2 cents a pound, as compared with 38.7 cents a pound in June, 1928. This decline may be attributed largely to increased wool production in Australia. Many other countries have expanded their sheep and wool production in recent years under the stimulus of satisfactory wool prices. The world wool clip of the past season was probably 5 or 6 per cent greater than that of the previous season. In the United States the number of sheep continued to increase. Production of wool (fleece) this year increased about 1 per cent over the production in 1928, and was estimated at about 302,000,000 pounds; it was 36 per cent greater than the production in 1922. In 10 countries which ordinarily produce a little over two-thirds of the world's output of wool, production in 1928 was estimated at 2,530,000,000 pounds (in the grease), an increase of 6 per cent over the production in the same countries in 1927. Stocks of wool at the beginning of the season at the principal primary markets were considerably higher than at the beginning of the previous season. The number of sheep sheared in 1929 in important wool-producing countries was probably larger than in 1928.

DAIRYING

In general the position of the dairy industry has been favorable this year, though not as markedly so as it was in 1928. Prices of butter, cheese, and other dairy products have not averaged as high as they did last year, largely because dairy production increased generally during the spring and summer months. In the fall, however, dry pastures curtailed production. Consumption during the year held up fairly well as compared with consumption in recent years. In the last eight years, despite a generally upward trend in dairy production, our domestic consumption of dairy products has consistently exceeded our domestic production by about 1 per cent. There is reason to believe that this close adjustment will continue. The dairy industry is very stable. It is not showing any immediate prospect of a marked expansion. Continuance of the stability it has shown in recent years should help the dairy industry to continue as one of the most satisfactory branches of agriculture.

As already noted, our dairy production is slightly less than our consumption, and during the fiscal year 1928-29 our net imports of dairy products were valued at \$19,854,000, as compared with \$20,392,000 in the previous fiscal year. Our dairy imports, as is usually the case, consisted largely of European varieties of cheese, and of fresh milk and cream from Canada. Our exports of dairy products consisted chiefly of condensed, evaporated, and powdered milk. This country usually imports some butter during the winter and early spring. This period coincides with the peak of dairy production in New Zealand, from which country the bulk of our butter imports come.

It seems probable that foreign competition from this and other sources will increase. From January to August, 1929, foreign butter shipments to Great Britain and Germany, the principal deficit areas of Europe, exceeded those during the corresponding period of 1928 by some 5 per cent, and the corresponding 1928

volume was 10 per cent more than that of 1927. Butter prices in the first eight months of 1929 averaged 10 cents a pound lower in Copenhagen, the principal foreign market, than the prices of corresponding grades of butter in New York. Any further increase in foreign supplies of butter might cause prices in foreign markets to fall to a level that would place foreign butter producers in direct competition with those of the United States. It is worth noting that important technical improvements have recently taken place in the dairy industries of New Zealand and Australia, with very favorable results upon production.

FRUITS AND VEGETABLES

Expansion in the fruit and vegetable industry has been rapid since the war, as is shown by the fact that receipts of fruits and vegetables at 11 large cities have doubled in the last seven years. Increases have been particularly striking in the receipts of some of the annually planted crops, notably lettuce, green peas, snap beans, cauliflower, spinach, carrots, and cantaloupes. Competition resulting from an increased supply of fresh products all the year round is felt very keenly by the canning industry. Accordingly, cannerys are energetically striving to improve the quality of their output. To that end they are developing methods of buying raw products from the farmers on a quality basis rather than at flat rates per ton or bushel. This method promises increased benefit to both producer and consumer.

Attention has been given by the department to specifications of grades for fruits and vegetables for canning, since the canner's requirements differ from those of the individual consumer. Inspection and grading of fresh tomatoes have been done experimentally at a number of factories, with results that seem to justify further effort. Inspection and grading accompanied by the payment of a premium for deliveries containing a high percentage of No. 1 fruit, mean increased returns for the careful grower and a more profitable output for the canner.

A study of car loadings of fresh products for the general market indicates a marked concentration of surplus production. Carload shipments of head lettuce, celery, cantaloupes, and bunched vegetables originate chiefly in a few well-defined and rather limited areas. Railroad shipments alone, however, no longer give a correct picture of the trade in fresh fruits and vegetables. It is necessary also to consider highway transport. Improved highways and motor transportation are profoundly changing this situation. Though the total volume of perishable farm products shipped by motor vehicles has not yet been measured, studies conducted by the department in certain typical markets and producing districts prove that in many cases the movement by motor far exceeds that by rail. In all producing districts within about 200 miles of large markets the transport of perishables over the highways is increasing rapidly.

Influence of Road Improvement

Road improvement is making nearly all of the farm land in the Eastern States potentially available for truck crops. Fruits and

vegetables may now be grown upon the land best adapted thereto, instead of being confined to land within a few miles of the city market. Thus more economical and more efficient production is insured in this region, and distant truck-growing areas will find it increasingly difficult to invade large eastern markets during the season of local production. Large car-lot shipments will therefore probably continue to be confined to regions that can market fresh products when such crops are not obtainable within possibly 200 miles of the larger consuming centers.

Motor transport affects the marketing of fruits and vegetables in other ways. Some truck operators are itinerant merchants who buy at the farm, for cash, products that formerly went to market for sale on commission. These distributors supply small stores, and sometimes homes, with fresh fruits and vegetables from nearby producing districts or from large distributing centers according to the season.

Irregularity of production continues to be the most disturbing influence in the fruit and vegetable industry. It is constantly threatened by an overproduction of tree fruits. Recent experience indicates that unsatisfactory prices must be expected whenever either citrus fruits or the more important deciduous fruits yield full crops throughout the principal areas of production. This year frosts in April did extensive damage, especially in California, and relatively high prices prevailed for all summer fruits. The demand for melons and other fruit substitutes was stimulated, and growers generally received better rewards than usual. Good returns thus obtained, however, are not necessarily evidence that fundamental conditions are satisfactory.

Speculative financing of annual truck-crop production by men who are primarily distributors continues to be a disturbing influence. Well-established growers may be financed year after year by responsible distributors with advantage to all concerned, if such distributors have wide market contacts. But the tying-up of large tonnages under crop-financing contracts by dealers whose outlets are limited is an unfortunate recent development, which results in unsatisfactory distribution. Often it causes a too rapid movement of ill-standardized products. The department can deal with this situation only by education. An experimental effort to solve the difficulty is in progress in the southeastern early-potato States, with Federal and State agencies and also growers and dealers cooperating.

Increased use of the inspection service of the department, in both domestic and export trade, has been made in the last year. Foreign buyers of tree fruits are more generally demanding Federal inspection. Information services conducted for the fruit and vegetable industries by the department are increasingly in demand, and are being extended. The produce agency act has been vigorously enforced.

POULTRY

Conditions in the poultry industry have been very favorable this year. Producers have received good prices for both poultry and eggs, and their costs of production have not been unusually high.

At present, stocks of eggs are relatively low and supplies of poultry, though probably larger than at this time last year, are not burdensome. Some further increase in poultry supplies is in prospect. The industry is undergoing rapid changes, however; and the penalty for inefficiency is quickly felt. Methods and equipment that were modern only a few years ago may now be almost obsolete. Specialized poultry farms are growing in importance, though farm flocks still produce the greater part of our poultry and egg crop. The trend is toward higher-quality production; and the producer who does not keep up with the times may find his poultry flock a liability rather than an asset.

Specialization is shown not only by an increase in the number and in the average size of the producing units, but also by an increase in the size of farm flocks in many sections, and by better care given to flocks. Turkey raising, after a long decline, shows vigorous new life, gained through the adoption of new rearing methods. In some sections turkey raising is very profitable.

Factors in Recent Development

The mammoth incubator, the commercial baby-chick hatchery, and the coal-stove or oil-stove brooder have been important factors in the recent development of the poultry industry. Producers using these devices can hatch and brood chicks in larger lots with less labor. Recent research has emphasized the necessity of vitamins in the poultry diet and shown how to supply them. New methods make it possible to keep hens producing well in large flocks under relatively close confinement. Electric lights prolong the feeding time in winter, and thus facilitate increased egg production. Methods have been developed by which chicks can be reared to 10 or 12 weeks of age and even longer in batteries of coops under the most confined conditions and with a minimum of labor. In this way the production of out-of-season broilers is simplified and an additional source of income afforded to many specialized poultry enterprises.

But these developments have complicated certain phases of the industry. Large hatcheries utilize the hatching eggs of a group of breeders, while the chicks produced are sold mainly to a different group. It is necessary to safeguard the quality of the poultry stock so handled. Moreover, the use of large incubators increases the risk of spreading disease. Flock and hatchery accreditation has been started in a number of different States to insure better and healthier stock. Considerable differences prevail, however, both in methods and in nomenclature, and some uniform plan is desirable to eliminate the resulting confusion. Changes are in evidence also in the packing and distribution of poultry and eggs. Competition is causing the consolidation of packing and distributing agencies. Cooperative marketing has been a factor in developing this competition. Competition also causes poultry and egg-packing agencies, both private and cooperative, to furnish service in an increasing degree to patrons or members. The demand for finer and better standardized products spreads the practice of buying eggs on a graded basis, to the great advantage of producers.

AGRICULTURAL CONDITIONS IMPROVING

Agricultural conditions in the United States continue gradually to improve. Farm incomes in the crop season 1928-29 averaged higher than those of any season since 1920-21 except 1925-26. The movement of population from the country to the town declined, and the rate of depreciation in farm-land values declined also. This is evidence of improvement in basic conditions. Much further improvement will be necessary before the situation can be considered satisfactory. Since the war agriculture has suffered grave disabilities which the farmers by their own efforts have not been able to remove. In consequence, they are still overburdened with debt. As of January 1, 1928, farm mortgage debt in the United States was estimated at \$9,468,526,000, as compared with estimated totals of \$9,360,620,000 as of January 1, 1925, and \$7,857,700,000 as of January 1, 1920. On the other hand, the farm bankruptcy rate was considerably lower in 1928 than in any year since 1922.

The position of agriculture in general at the close of the crop season 1928-29 was better than at the close of the preceding year, and there are prospects of continued improvement. The crop season 1929-30 began with a rising farm-commodity price level, and with only moderate supplies of the principal products in prospect. These circumstances, joined to the expectation that benefit will accrue to agriculture from the operation of the Federal Farm Board under the new agricultural-marketing act, warrant confidence that better times are in store.

Aggregate gross income from agricultural production in the United States for the crop season 1928-29 is estimated to have been \$12,527,000,000. This was about \$225,000,000 more than the aggregate gross income of the preceding year. Cash income from the sale of farm products is estimated to have totaled \$9,949,000,000, or an increase of \$79,000,000 over the corresponding figure for 1927-28. Net income of the farmers did not increase proportionately because farm operating costs, taxes, and interest on debts advanced somewhat. The income available for living on the farm, including the value of the farm products used by farm families, was only about \$16,000,000 greater than in the previous season. The return earned on the current valuation of agricultural property was about the same, namely 4.7 per cent, compared with 3.1 per cent in 1922-23 and 1.4 per cent in 1921-22.

Livestock Enterprises the Most Profitable

Higher prices for livestock and livestock products were the principal cause of the improvement in the season's agricultural income. Increased unit prices more than offset a reduction in the volume of cattle, hog, and lamb sales. Income from meat animals was \$145,000,000 more than in 1927-28, and income from dairy and poultry products was more than \$200,000,000 greater. Income from grains and fruits and vegetables, on the other hand, was smaller. Reduction in the income from wheat and from potatoes was particularly marked, the markets for these products being oversupplied. The outlook for the present season is in sharp contrast in some respects with the results of last year. This season a short world wheat crop has

raised the price of wheat, and a short potato crop in the United States promises increased returns from that crop. The expectation of an increased aggregate income for agriculture rests primarily on the improved position of grains and fruits and vegetables. Indications are that the income from livestock may be little or no greater than it was in 1928-29.

In August the prices received by farmers for their principal products averaged 143 per cent of the pre-war level, compared with 139 per cent in August, 1928. It seems probable that the average level of prices for the 1929-30 season will be fairly close to the August average. This average may be compared with the corresponding figure for 1921-22, when the average farm-commodity price level was only 119 per cent of the pre-war average, while the price level of the commodities usually bought by farmers was more than 150 per cent of the pre-war level. In the last few years the prices of the commodities usually bought by farmers have not advanced but have remained in the neighborhood of 156 per cent of the pre-war level. In other words, the exchange value, or the purchasing power of farm commodities, has improved. In the calendar year 1928, for example, the prices received by farmers per unit of their principal products would buy about 90 per cent as much as the corresponding prices of the pre-war period. This purchasing-power ratio was 15 per cent higher than the corresponding figure for 1921.

Meaning of the Purchasing-Power Index

Improvement in the purchasing power of farm commodities, however, is not necessarily synonymous with an improvement in the purchasing power of the farmer. Since the farmer's purchasing power depends on the quantity of the commodities he has to sell as well as on their relative unit price, the purchasing-power ratios here quoted must not be overestimated as an index of agricultural prosperity. They are valuable in comparing one year with another; but a true measure of agricultural conditions necessitates taking many other things into the reckoning. Final proof of agricultural improvement must rest, not on price comparisons alone, but on evidence that the margin between total costs of production and total prices received is increasing. Only when the farmer's net income increases more than the prices of the things he must buy does he obtain an increase in purchasing power. In the last few years a substantial gain of this character has actually taken place. But the crop year 1928-29 saw more improvement in the gross farm income and in the price situation than it saw in the net income of the farmers, because of increased costs, including higher taxes.

The fact should not be overlooked, however, that a diminution in net farm income which may be due to an increase in taxes does not necessarily mean an impairment of the rural standard of living in general. Funds raised by taxation are in the main expended for local purposes, such as schools and roads and other community facilities. With economical use of funds, this may add as much to the general standard of comfort in the community as would have been added had individual farmers spent the money themselves instead of paying it out in taxes.

Agricultural Property Valuations

In the last two seasons the current value of agricultural property has increased. Land values in the season 1928-29 declined slightly, but the value of personal property, including livestock on the farm, increased sufficiently to raise the estimated current value of agricultural real estate and personal property to \$58,645,000,000. This was an increase for the year of nearly \$400,000,000. In view of the drastic decline that took place in agricultural values in the early years of the depression period, this recovery seems very modest. That decline was due to financial deflation and to depreciation in the earning power of agriculture. While the recent gain seems small, it is encouraging. The advance has been largely due to a rise in the value of livestock on the farm, and an increase in livestock production may mean a lower valuation for this item. On the other hand, continued improvement in farm incomes should strengthen the upward trend by stimulating activity in farm real estate.

FARM-LAND VALUES

Farm-land values have developed encouraging tendencies. As is well known, the general movement has been downward since 1920. While it is not yet possible to record a uniform change from the general downward movement, the latest data available indicate that farm real estate values have been appreciably nearer stability during the last year and a half than at any time since the downward movement began.

A survey made by the department for the 12 months ended March 1, 1929, showed that for the country as a whole farm-land values declined by 1 per cent. This was the smallest loss in any year since the postwar depression began and was nominal compared with the declines of 1921, 1922, 1923, and 1924. State and regional averages as a rule showed few of the sharp declines frequently recorded in the years immediately preceding. In the North Central States, for example, the year's decreases did not exceed the national average of 1 per cent. Values in the Southern States likewise declined only slightly during the 12-month period in question. In the Mountain States and the Pacific Coast States values held up well toward the previous year's level, and in a few States, including Montana, Wyoming, Arizona, and New Mexico, a slight upward tendency was manifest.

Current changes in farm-realty values are of course largely an outgrowth of economic disturbances caused by the war. In the post-war "boom" farm real-estate values for the United States as a whole rose to a level averaging 70 per cent above the pre-war level. Then followed a drastic decline to a present level 16 per cent above the pre-war average. Thus for the country as a whole, up to March 1, 1929, more than three-fourths of the war-time gain over pre-war levels had been canceled. In some States the drop considerably exceeded the national average and carried average values to pre-war levels or below. These percentages, moreover, make no allowance for the changes in the value of the dollar. When allowance is made for the decline that has taken place in the purchasing power of the

dollar during the last 14 years, it appears that farm real-estate values for the United States as a whole on March 1, 1929, were 20 per cent lower than in March, 1914. In other words, an acre of land that in 1914 could have been exchanged for 100 commodity units would have brought only 80 such units in March last.

Forced Sales and Related Defaults

Forced sales and related defaults in connection with farm land decreased during the 12 months ended March 1, 1929. In that period the rate of forced sales and related defaults was approximately 19 farms per 1,000 farms, as compared with 22 and 23 farms per 1,000 in preceding years. Much improvement is necessary to restore normal conditions. The foreclosure rate is still very high, and the farm bankruptcy rate is seven times the pre-war figure. On the other hand, the transfer of farms by voluntary purchase or sale is far below normal. As a result, much land is held by mortgagees under conditions which seem likely to make it a problem for some time. It is unfortunately still true that in discussing the farm real estate situation we must record improvement in terms of lessened damage rather than in terms of positive gain. Nevertheless, the situation is clearing, and it may shortly be possible to exchange negative for positive terms in describing developments.

It is desirable to guard against a tendency, often shown heretofore, for farm real estate values to be bid out of a reasonable relationship to the farm earnings that can be conservatively expected. In the postwar boom period 6 per cent mortgages on land yielding not more than 3 per cent on their capitalization were not uncommon. Farms thus overcapitalized carried a heavy burden of charges, and had an insufficient margin of safety when farm earnings declined. Under such conditions farm ownership tended to lose its appeal, for tenancy was often more profitable.

Overoptimism in farm-land valuations tends, since the error must eventually be corrected, to be followed by a period of undue pessimism, during which values are driven below the level justified by earnings. Credit may then be unduly restricted. In the first case, easy credit causes prices to be bid up excessively, while in the second case restricted credit causes prices to fall too low. More study of the factors that ultimately determine farm-land values is required, so that the farm realty market will be less influenced by uninformed opinion. Fundamental research combined with accurate and continuous current information should help to discover the basis upon which farm-land values should be stabilized.

Necessity of Sound Capitalization

Agriculture can not be continuously prosperous unless the structure of its capitalization is sound. Mistakes in this field may largely offset the value of efficient farm management, good adjustment of production to demand, orderly marketing, and intelligent use of land resources. Adequate research and analysis of the farm-land-value situation would have disclosed some of the weaknesses that came to light after the war, and served as a useful warning against inflation.

Though farm valuations are not inflated to-day, they may again become so if precautions are not taken. Adequate research is the first necessity. The department is engaged in studies as comprehensive as its resources for the work permit.

USE OF POWER MACHINERY

In recent years a rapid technical evolution has taken place in American agriculture, characterized distinctively by a substitution of mechanical power for human and animal labor. Most of the change has developed since the European war. Comparisons limited to the postwar period are not available. Some idea of the magnitude of the change can be gained, however, from the fact that between 1870 and 1925 the average area of improved land cultivated per farm worker increased from 32 to 49 acres, or slightly more than 50 per cent. In the same period the value of machinery on farms in terms of 1913 dollars increased tenfold, or from \$270,000,000 to \$2,700,000,000. In value of machinery per farm worker, in terms of 1913 dollars, the increase was from \$36 in 1870 to \$200 in 1925, a gain of 455 per cent. American farm workers using mechanical power now produce from two to five times as much as similar workers in the older countries of Europe. Though all parts of the country have been affected more or less by this technical progress, the western grain-growing areas have been affected most. Mechanical power is rapidly replacing horsepower in heavy work such as plowing and disking in all parts of the country, and in the last few years machinery has become important for cultivating row crops and for grain harvesting.

The introduction of tractors suitable for cultivating corn, cotton, and potatoes is comparatively recent. Previously the standard method of cultivating corn was with the 2-horse, 1-row cultivator. Under the old conditions one man could cultivate from 30 to 50 acres of corn, according to the topography and the character of the soil. With one of the new power cultivators equipped for 4-row cultivation, one man can cultivate from 160 to 200 acres of corn. In the same manner he can cultivate about the same acreage of cotton. This gain in the acreage one man can cultivate tends to increase the size of farms in the central Corn Belt and in the western part of the Cotton Belt. It materially reduces unit costs of production. Following the introduction of the tractor-cultivator the number of horses needed on corn and cotton farms decreased sharply. From 1918 to 1928 the number of farm horses in the United States decreased more than 7,000,000 head. Simultaneously the automobile and the truck practically replaced horses in cities. There resulted a marked decrease in the demand for corn, oats, and hay. However, the decrease in the demand for corn for horse feed was partly offset by a slight reduction in the acreage of corn and by increases in other kinds of farm stock.

The Increase in Tractors

An indication of the rapidly growing use of mechanical power on farms is the increase in the number of tractors manufactured in this country. In 1917 the number produced was 62,742. Though this

was double the production of 1916, it was less than half the number turned out in 1918. It is estimated that in 1928 there were approximately 853,000 tractors on American farms. Tractors have recently been greatly improved in design and construction. The early farm tractors were large and proved unwieldy on land already under cultivation. Then followed a reaction toward very small tractors. To-day a middle course is followed; the tractors now turned out are somewhat larger than those that were popular a few years ago. In the northern Great Plains region the 3-plow and 4-plow tractor is coming rapidly into use, and there is some demand for 6-plow tractors.

More strongly built implements to hitch to these tractors are required. Manufacturers have been cautious about producing such equipment, fearing that their necessarily higher price might interfere with sales. It is now coming to be recognized, however, that the great power of the modern tractor necessitates strongly built attachments. A typical example of the labor-saving effected by the use of the tractor is given in a recent study made by the University of Arkansas, which showed that a rice farmer in that State using tractor equipment could accomplish three, four, and even five times as much as he could with earlier methods. In one rice-growing county in Arkansas the survey showed 1,507 tractors, or 1 for every 63 acres of rice.

In many western localities farmers have increased the size of their implements, and the area of land they till, by using large teams. This is practicable through the use of hitches that compel each unit of the team to do its share of the work. Teams of 12 to 20 horses are not uncommon for plowing, disking, harrowing, and seeding, and on some of the combines in the Pacific Northwestern States as many as 32 horses are used effectively. A contest is on between the tractor and the big team, the outcome of which is not yet determined in many localities.

Trend Toward Larger Farms

Large power units of farm equipment are undoubtedly the chief cause of the recently accelerated trend toward an increase in the size of farms. It has been estimated that from 1915 to 1917 Montana had about 35,000 wheat farmers, many of them operating half-section or small farms. To-day Montana probably has not more than 14,000 wheat farmers. These men, however, are handling more acres and doing the work better than it was formerly done by 35,000 farmers. New types of implements for cultivating summer fallow have helped to increase the size of farms in the Plains and in the Mountain States of the West. One of these implements is called the "duckfoot." Use of the duckfoot first became general in the Columbia River Basin, and spread therefrom to Montana and other States east of the Rockies. Some wheat growers in the State of Washington substitute this implement for the plow. One farmer in that State, using 16-horse teams on 12-foot duckfoot cultivators as a substitute for plows, is able to farm 1,600 acres per man. Another new implement that is gaining in popularity in the central and northern Plains region is the 1-way disk summer-fallow cultivator, which permits a more effective cultivation and results in better yields.

Outstanding in postwar mechanical developments in agriculture is the rise of the combined harvester-thresher (known everywhere among farmers as the "combine"), in the territory east of the Rockies, where it was formerly believed that wheat could not be left standing until ripe enough to be harvested by the combine. When the practicability of the new method of harvesting was demonstrated for the Plains region, the introduction of the combine was extremely rapid. In 1926, 30 per cent of the Kansas wheat crop was harvested by the combine, 8,274 machines being used in the work. In 1928 Kansas had 20,000 combines. The combine appeared in North Dakota for the first time in 1925. Three years later in that State 1,000 combines were used in small-grain harvesting.

Wheat Harvesting by "Combine"

This year more than half of our hard winter wheat, one-fifth of our hard spring wheat, and a smaller proportion of our soft winter wheat was harvested by combines. This machine eliminates the grain binder, the shocking of the wheat, stacking, and the use of the threshing machine. It reduces the cost of harvesting to a small fraction of what it formerly was. A serious problem connected with the use of the combine is the fact that much combined grain contains more moisture than grain may safely contain when put in a bin. Accordingly, means are being studied whereby the moisture content of grain may be reduced before it is placed in storage. Indications are that a solution of this problem will be found.

Increased use of automobiles and trucks for road work has greatly extended the market area available to farmers. In 1926 farmers on the eastern shore of Maryland and Virginia moved 1,162 carloads of strawberries by truck. Some of the shipments went as far north as Albany, N. Y., and Boston, Mass. Grapes from Michigan are to-day moved as far as Indianapolis, Ind. In some instances hauling by automobile and truck saves two-thirds of the farmer's time in delivering his products. A recent study showed that before the introduction of trucks the market points used by a certain group of farmers averaged 7 miles from the farm. After the introduction of trucks the average distance to market points was 18 miles.

Cincinnati, Indianapolis, Detroit, Milwaukee, Minneapolis, and St. Paul receive 90 per cent of their milk supply by motor truck. Receipts of hogs, cattle, calves, and sheep by truck have increased at most of the large livestock markets. In 1928 more than 50 per cent of the hogs received at Indianapolis, Oklahoma City, and Sioux City, and an equal proportion of the cattle received at Indianapolis, the calves received at St. Joseph, and the sheep received at Indianapolis, Louisville, and Oklahoma City arrived by other means than rail transportation, mostly by truck. At Chicago, the percentage, while increasing, has remained negligible. In the last five years the number of Illinois hogs marketed by truck has risen from 7.9 to 22.5 per cent of the total marketed. This change has been accompanied by an increase in the percentage of all hogs moving directly from farm to packing plant. Fourteen per cent of the fruits and vegetables grown on the Delaware-Maryland-Virginia Peninsula, including

more than half of the more perishable commodities, such as strawberries, peaches, and cucumbers left that area by motor truck in 1928. Fourteen per cent of the receipts of fruits and vegetables at Newark during 1928, at least 5 per cent of those at San Francisco, and at least 9 per cent of those at Boston, arrived by truck. Perishable commodities produced within 200 miles of their market seem to offer the principal field for truck movement.

FARM RELIEF

Outstanding among the events of 1929 was the passage of the agricultural marketing act. This measure, the result of eight years of discussion in the press, in agricultural circles, and in Congress, is essentially intended to enable agriculture to effect a better adjustment of production to demand and a more efficient system of marketing. Its adoption closed a period of debate and opened one of action. Though opinion was sharply divided during the preparation of the law, its enactment was hailed with general approval and satisfaction.

This is not the place for a detailed analysis of the agricultural marketing act, nor for any forecast of its results. In view of the importance of the measure to agriculture and to the Nation, however, it seems appropriate to mention its principal provisions and to note some of the conditions with which it must deal. It sets up a Federal Farm Board with unusual powers and resources. It contemplates that rural prosperity may be increased by the creation of a new agency to function parallel with other governmental establishments in the furtherance of a broad and constructive program for agriculture.

The program as set forth in the agricultural marketing act contemplates: (1) Strengthening the bargaining power of producers and increasing the efficiency of their marketing operations through the development of effective cooperative-selling associations, stabilization corporations, and clearing houses; (2) stabilizing the supply of agricultural products and minimizing fluctuations in prices by preventing surplus production in so far as possible, and by effective distribution of surpluses once produced; (3) assisting in developing a national agricultural policy with reference to land utilization, marginal lands, and, in general, the control of the farm-land area; (4) assisting in broadening markets for agricultural products at home and abroad and, more specifically, through the development of by-products of and new uses for agricultural commodities; (5) helping to correct maladjustments in transportation conditions that work hardships on agricultural producers in any section of the country; and (6) assisting in minimizing undesirable speculation in agricultural commodities and eliminating waste in their distribution.

In short, while in the act itself stress is laid upon the effective organization of cooperative-marketing associations as a means of improving farm conditions, it is apparent that Congress contemplated a broad approach to the problem, embracing all major economic factors that materially influence farm incomes.

Act Is Specific as to Methods

The agricultural marketing act is specific regarding the methods which it is expected the Federal Farm Board will use in furthering this program. It directs that education in the principles and practices of cooperative marketing of agricultural products be energetically promoted. It also directs the board to promote the organization and development of effective cooperative-marketing associations. It contemplates that where conditions require such action, the board will assist in the organization of stabilization corporations and clearing houses to assist in tempering the influence of abnormal surpluses upon prices. It provides for far-reaching financial assistance to cooperative-marketing associations and, for this purpose, authorizes a revolving fund of \$500,000,000. It contemplates that the board will utilize the services and the results of research of other organizations in the development of its program.

In creating this new agency Congress evidently intended that it should not supersede the Department of Agriculture and other existing agencies, but should coordinate its activities with those agencies. Close cooperation between the Federal Farm Board and the Department of Agriculture is necessary. The terms of the agricultural marketing act show that Congress did not intend to create a new Federal agency with duties overlapping those of this department. Such a course would weaken one or both organizations. But the board is clearly expected to supplement some of the department's work. In the great task of reorganizing agriculture in many important respects, the board will be on the firing line while this department will, to a large extent, make and supply ammunition. As an organization for research and for service to agriculture and for the enforcement of regulatory laws, the department will continue to function as it has done in the past. It is not the suitable agency to make practical application of all the facts its investigations bring to light, nor has it the legal authority to do so. In this field the board can do what the department can not do.

Opportunity for Cooperation

Every opportunity exists, therefore, for harmonious and fruitful cooperation between these two Federal agencies. The department's crop and livestock reporting services, its market-news and outlook reports, its work on grading and standardization, and its studies of agricultural prices, cooperation, land utilization, and other agricultural matters, will undoubtedly be of great assistance to the board. Doubtless also the board will call upon the department for special research and service work. Agricultural investigations and services are all interrelated. It is therefore not improbable that the department will be called on to assist the board in many ways related to the immediate and the long-time purposes of the agricultural marketing act.

By a curious coincidence the agricultural situation, when the Federal Farm Board began its work, was unusually free from difficulties due to surplus production. It need scarcely be said, however, that surpluses will recur. Wise planning may establish a better average balance between production and supply, but can not wholly obviate

the effect of exceptionally favorable weather on production. Seasonal surpluses will be produced inevitably from time to time. The great task of the Federal Farm Board is to assist agriculture in making surpluses less frequent, less burdensome, and easier to handle.

Much more is required than merely the financing of cooperative associations. This is clear from a glance at the many reports that have been made in recent years on the condition of American agriculture by public and independent agencies. Among these may be cited a report in 1926 by the National Industrial Conference Board, and another in the same year by an advisory committee of the Social Service Council; a report in 1927 by a special committee of the Association of Land Grant Colleges and Universities; a report prepared in 1927 by a business men's commission acting under the joint auspices of the Chamber of Commerce of the United States and the National Industrial Conference Board; and a report in August, 1928, by a special committee of the United States Chamber of Commerce.

Though naturally varying in their emphasis on different aspects of the agricultural problem, these reports had much in common. They drew attention to the results of the world-wide economic disturbances occasioned by the war, to the long-time effects of unwise land utilization, to the seasonal effects of wrongly planned acreage and livestock breeding, to the wastes of unregulated competition and haphazard marketing, and to the hardships sometimes imposed on agriculture by an inadequate credit system. Evils thus deeply rooted can not be remedied overnight. Nevertheless, I think we may say that the machinery set up under the agricultural marketing act promises a more effective and continuous remedy than has heretofore been possible.

Status of Cooperatives

In view of the important functions assigned to the cooperative associations in the Federal Farm Board's program, it will be useful to glance at the status of the American cooperative movement. What cooperative machinery lies ready to the board's hand? What foundation has been laid for future building? It is satisfying to report that the current year has seen good progress in cooperative marketing, in general efficiency as well as in membership and in business done. Increased attention has been given to the development of large-scale organizations, to the centralization of sales, and to the possibilities of regional federation. In recent years membership in cooperative associations and their volume of business have increased more rapidly than the number of associations. In other words, the cooperative units have become larger. This tendency, which promises to continue, lessens selling competition and facilitates efficient distribution. It is in line with the Federal Farm Board's expressed desire that cooperative development shall be effected primarily through a strengthening and a closer integration of existing associations, rather than by causing a new crop of associations to spring up.

The first cooperative associations in this country were local bodies formed to provide better and cheaper marketing facilities. In some areas these developed into regional organizations. Eventually asso-

ciations were set up for cooperative selling in the terminal livestock and grain markets. Livestock cooperative agencies now operate in 26 important livestock markets, 12 of them in affiliation with the National Producers' Livestock Marketing Association, and 9 with Farmers Union organizations. The others are independent. Some progress has been made toward the centralization of grain marketing, though in this field differences of opinion as to methods have not yet been settled. Hence, centralized grain marketing is in a relatively early stage. Large federations of cooperative creameries and cheese factories have been developed through the federation of independent local units. Numerous large dairy cooperative associations are affiliated in a national body. In fact, the last four or five years have seen a very strong trend toward an increase in the size of cooperative units and a disposition among them to federate for coordinated marketing. One striking index of the present status of the American cooperative movement may be seen in the fact that more than 200 farmer-owned associations now each transact an annual business exceeding \$1,000,000.

Units Largely Unrelated

Nevertheless, the movement is still made up largely of unrelated units that inevitably work to some extent at cross-purposes. More than 90 per cent of the associations now functioning are independent local or regional bodies having little contact with other cooperatives. More than 300 associations market potatoes. There are 6 or 7 large organizations that handle from 1,500 to 8,000 cars annually, but this represents only a fraction of our potato production. As a result, potato selling is highly competitive, and little progress has been made in adjusting the production of potatoes to the probable demand. Efforts toward coordinated production and marketing in one region tend to be nullified by unregulated production and haphazard marketing elsewhere. The same condition exists in many other branches of agriculture. Centralized organizations for coordinated marketing are indispensable if full advantage is to be taken of the agricultural marketing act.

Under the agricultural marketing act rapid progress in the coordination of cooperative marketing may be expected, inasmuch as greater unity of effort among producers' organizations is a leading object of the act. Support is not to be given to the upbuilding of unrelated cooperative units in the same branch of agriculture, since to do so would increase wasteful competition in marketing between producing groups and between producing regions. Thinking in local or regional terms, necessary in the early stages of the cooperative movement, must now be supplemented by thinking in commodity terms. Such a view of cooperative requirements is entirely consistent with the continued growth of local and regional associations, provided these become units in a coordinated movement. Time will be required to work out the necessary details of this principle. But when it is applied, an important step will have been taken toward placing agriculture on a parity from a business standpoint with other industries.

FARM TAXATION

Taxes on farm property continued to increase slightly during the past year. For the country as a whole the increase amounted to about $1\frac{1}{2}$ per cent. In the east North Central States there was a slight decline; taxes in the Middle Atlantic and the Mountain States remained at the level of the previous year. In all other sections increases occurred. The normal tendency of public expenditures is to increase. Hence reduction in farm taxes is not usually to be sought through general reductions in public expenditure, but rather through readjustments tending to equalize tax burdens among all tax-paying groups.

Farm taxation mainly concerns State and local governmental units rather than the Federal Government. Accordingly, the department's studies of the problem are largely conducted in cooperation with research organizations in the several States. Research results brought together within the past year indicate that during the last five years taxes have taken about one-third of the net rent on rented farms. This fact gives some idea of the tax burden on all farm property. Detailed studies in 14 States extending from New Jersey to Washington and as far south as South Carolina provided the basis for this estimate. It is estimated that in 1928 farmers paid \$1.42 in taxes on each \$100 of actual value of their real estate. This ratio should not be confused with the tax rate, which because of the general custom of underassessing all property would average much higher.

Chief among the reasons for the excessive weight of farm taxation are the dependence of local governmental finance on the general-property tax, and the fact that farmers, more than any other group, have their productive property in a form that can not be missed by the assessor. State governments are making increasing use of sources other than general property from which to secure revenue, but little use is made of such sources by local governmental units.

Broadening Assessment Basis

Changes in taxation that broaden the assessment basis of the general-property tax or that use reasonable indices of tax-paying ability other than the ownership of tangible property can not fail to be of advantage to farmers. Along with or perhaps in advance of such changes must go improvement in the administration of the tax laws. The averages that have been quoted do not indicate the great differences that exist in the weight of taxes from farm to farm. When taxes were light, inequality in their incidence was of minor importance. Even the persons most highly taxed were not taxed so heavily as to feel injured. Injustice existed, but did not make itself acutely evident. Now, however, many persons in the group that is taxed materially above the average find their tax burden unbearable.

Recent studies in a Western State indicated that, because of inequalities in assessment, owners of half the real estate paid two-thirds of the taxes. This condition existed in the State as a whole and to a greater or less degree in its local administrative units.

Studies in other States showed similar conditions. Improved assessment would lower the taxes of many now unfairly burdened. It would necessarily increase the taxes of persons now assessed on a basis lower than the average, but the result would be more equitable than is the present situation. Improved assessment would also put on the tax roll property that heretofore has escaped taxation. Since the property added would be mainly nonagricultural, the burden on farm property would be lowered. In many parts of the country improvement is possible in the collection as well as in the assessment of taxes.

No single program of tax reform could be devised to fit all the States. It is worth noting, however, that State taxes on personal income are being increasingly used to raise revenue. In some States a low-rate tax on intangibles has materially increased the revenue secured from intangible property. The sales tax on gasoline is universal and yields much revenue and State sales taxes on nonessential commodities make a small contribution. Severance taxes, levied when a natural resource is used up, yield large revenues in certain States that have mineral resources. By adopting one or more of these taxes a State may relieve tangible property measurably.

Increased State Aid for Roads and Schools

Increased State aid in the building and maintenance of roads and in paying the costs of education is broadening the tax basis for the support of these public services in some States. Few States, however, have gone as far as they might in assisting in this way their communities of relatively low tax-paying ability. Such communities, which are often farming regions, are usually forced by State laws to maintain high standards of education. The State should accept the responsibility of helping to maintain such standards, when the burden on local property exceeds certain limits. Much of the desired improvement in the farm-tax situation can come only through the action of the community as a whole. It is necessary to consider not only farm taxes, but the use that is made of the proceeds. Sometimes public expenditures may advantageously be increased. For effective tax reform, this fact must be borne in mind, as well as all pertinent facts relating to tax burdens.

FARM CREDIT

Farm credit remains costly in many parts of the United States notwithstanding the great improvement that has been made in agricultural-credit facilities during the last 10 or 15 years. The Federal reserve act of 1913, the farm loan act of 1916, and the intermediate credit act of 1923 brought about favorable changes of fundamental importance. Further progress may be expected from the financial provisions of the agricultural marketing act of 1929. As yet, however, the potentialities of our credit system are reflected very imperfectly in the terms and conditions under which many farmers obtain credit. In many instances the gap between the supply of credit at central money markets and the farmers' credit requirements has not yet been bridged. In the case of production and marketing credit, local facilities through which the farmer can avail himself

of the credit channels established by the Federal reserve and the intermediate credit acts are too often lacking. In the case of mortgage credit the facilities are generally within the farmer's reach, but want of knowledge concerning them frequently prevents their use. In parts of the South, for example, a substantial proportion of the credit used by the farmers is obtained by them from merchants rather than from credit institutions. It takes the form of time payments for goods purchased. A study made by the department in the Southeastern States showed that the cost of such credit averaged more than 25 per cent per annum. Credit for fertilizer obtained on this plan generally costs about 35 per cent. Farmers having both merchant credit and bank credit paid from two to four times as much for the former as for the latter. Average credit costs for all the short-term agricultural credit used, including cash credit from banks, ran from 10 to 15 per cent. Even land mortgages on good security often carried 8 to 10 per cent interest, although the rate charged by the Federal farm loan system was less than 6 per cent. Frequently the cost of loans was out of all reasonable proportion to the risk.

Financial Isolation of Farm Communities

The financial isolation of farm communities has much to do with the relatively high cost of agricultural credit. Such isolation permits a wide range of charges, and great fluctuations in the local supply of credit. Commercial banks, the most important source of short-term credit for agriculture, are too numerous and too small in some areas. This is a more or less inevitable outgrowth of competition for the loan business and of trying to bring credit facilities within convenient reach of all prospective borrowers. The situation has been modified but not yet corrected by improved transportation. Country banks usually concentrate their loans in very restricted areas, with a corresponding concentration of risks. As a result, both local and nation-wide agricultural depressions speedily exhaust their resources. As is well known, country-bank failures have been exceedingly numerous in recent years. These institutions were subjected to severe strain as a result of war-time inflation followed by monetary deflation and by depression of agricultural values. The situation in local banking is improving as a result of economic progress in agriculture generally and because of better management of banks and a strengthening here and there in State laws.

Improvement is not so much a question of providing new credit institutions as of improving the functioning of those in existence. Much might be accomplished on the initiative of the lending institutions themselves. Such institutions, particularly in regions where crop specialization is the rule, often fail to see the need and wisdom of making loans for side-line enterprises, such as dairying or live-stock raising. Hence the farmers' demands for such credit often go unsatisfied. In regions where such enterprises are relatively undeveloped, they may afford a profitable opportunity for utilizing labor time that would otherwise be lost. Credit institutions are often slow to recognize new opportunities created by improved machinery and by technical progress generally for the profitable use of credit in agriculture. A more progressive attitude on the part of such in-

stitutions would enable many farmers to increase their income substantially.

Farmers themselves, of course, can help toward the improvement of the credit situation. As individuals they can do so by observing sound principles in the use of credit. During a period of high money rates, for example, it is obviously desirable, whenever possible, to defer mortgage financing. It is also desirable that more farmers should recognize the advantage of obtaining a greater proportion of their necessary credit from specialized credit institutions, rather than from merchants who ought not to be asked to do a banking business. Study of market prospects, before applying for production loans, will help the individual farmer to improve the general credit situation. Collectively, farmers have very extensive opportunities for bringing about improvement. Since the intermediate credit act was passed large amounts of credit have been utilized successfully by the cooperative associations.

Their field of opportunity is widened by the enactment of the new agricultural marketing act, which provides for loans to cooperative associations for the acquisition of plant and equipment. It thus meets an urgent need. This act also provides for loans to assist in the formation of clearing-house associations and in the extension of cooperative membership. Loans made available for these purposes will constitute an addition to the existing farm-credit structure, rather than a substitute for any part of it and are, therefore, a distinctly new and important contribution to the solution of the farm-credit problem. Commodity loans which the Federal Farm Board is authorized to grant, supplementing loans from existing agencies, should be conspicuously serviceable in relieving farmers from compulsion to market their crops at harvest time regardless of price conditions.

Field for State Action

In the improvement of agricultural credit, there is a broad field for action by the several States. Most banks that serve farmers operate under State supervision. Improved banking laws are needed in many States. It is necessary to insure increased safety for deposits, as well as to improve credit facilities and credit practice. Some States maintain legal restrictions on interest rates that really make credit dearer. When legal rates are lower than those quoted in central markets for loans with a favorable term and good security the flow of credit into the community is diminished and loanable funds within the community tend to be diverted into outside investments. With resulting scarcity of local credit, farmers may thus be forced to resort to costly merchant credit. Regulations that attempt to set aside economic laws need to be replaced with more practical ones, in harmony with the principles of money and banking and at the same time properly adapted to agricultural requirements.

MOVEMENTS OF POPULATION

Evidence that the drift of population from the country to the town continues is contained in a survey made by this department covering 1928. Our farm population at the end of 1928, according

to this estimate, was the smallest in more than 20 years. Though the gross movement of persons from the farms was somewhat smaller in 1928 than in 1927 and 1926, it comprised the formidable total of 1,960,000 persons. This figure was largely offset, however, by the movement of 1,362,000 persons from cities, leaving a net movement of 598,000 persons from the farms to the cities. The corresponding net movement for 1927 was 604,000 persons; for 1926, 1,020,000; for 1925, 834,000; for 1924, 679,000; for 1922, 1,120,000. No estimate was made for 1923. Farm population as of January 1, 1929, was estimated at 27,511,000, as compared with 32,076,960 as estimated by the census for January 1, 1910.

In these cross currents of population, the net movement from the farms to the cities is not synonymous with the net annual loss of farm population. This latter figure must be calculated after allowing for birth and death rates. A birth rate much higher than the death rate on farms makes the net annual loss of population much less than the annual migration figures would suggest. Thus in 1928, the net loss of farm population, with allowance made for birth and mortality on the farm, was estimated at 188,000 persons, as compared with 193,000 in 1927, 649,000 in 1926, 441,000 in 1925, and a total of 2,000,000 in the years 1920 to 1925.

Loss of population in the country due to townward migration has taken place in parts of the United States for many decades. Though the postwar depression increased the loss, it did not account for it wholly. Technical progress on the farm, as a result of which it becomes possible to feed an increasing population with less farm labor, has much to do with the phenomenon. Farming processes in the United States have been mechanized at an extraordinary rate since the war. This progress, with its associated labor-saving, was not sufficiently offset by an increase in the demand for farm products. By an inevitable necessity, therefore, the farm population declined. Since the net loss has declined quite steadily in the last few years, the exceptional forces responsible for the extraordinarily heavy postwar movement appear to be losing momentum.

The Probable Trend

Future movements of population from the country to the town will be influenced by the degree of prosperity prevailing in agriculture, by the rate at which machinery is substituted for human labor, by further developments of scientific production, and by the growth of markets at home and abroad. In all probability the balance between urban and farm population will continue to run in favor of the towns. Our concern is, however, that the movement of population, at whatever rate it may take place, shall be in harmony with the Nation's social and economic advance. When it is too great, as it may possibly have been in some years recently, the agricultural industry is deprived of necessary man power, and compensating adjustments are made necessary at great national expense. When the movement is too small, competition in agriculture rises to a point at which farm profits tend to disappear. Some evidence exists that the population movement is approaching stabilization on a basis consistent with the national good, and that necessary

changes in population elements will be brought about rapidly enough to avoid hardship and distress.

FARM LIVING STANDARDS

In the last eight years the department has accumulated considerable data on family-living standards on the farm. Though sufficient progress has not been made to permit a thoroughgoing comparison between farm standards and city standards, much has been learned about the living standards of certain groups of farmers. It has been demonstrated, for example, that family-living standards are deficient on a large proportion of the small farms in the country. That is an important fact necessitating remedial action, for small farms are relatively more numerous than is commonly supposed. In 1925, when the average number of acres per farm in the United States was 145, 38 per cent of all the farms were under 50 acres and 60 per cent were under 100 acres.

Family-living standards are of course not low on all small farms. Many small farms devoted to varying types of agriculture produce net incomes equal to the average on larger places. It is nevertheless true that a majority of the small farms in the United States are low income producing and low-value farms. Such farms in 1925 were estimated to be worth, for land and buildings, less than \$4,000 on the average. A considerable proportion had a value of \$2,000 or less. Many small farms have poor soil and difficult surface conditions. Probably nearly 40 per cent of the country's farm population lives on small farms of poor and difficult land, on a standard of living far below what is common on large farms.

Farm families belonging to this low-standard group are numerous in nearly all the States. How to improve their condition is a complex problem involving economic, social, and human factors. It is not primarily a question of tenancy versus ownership, nor a question of cropper cultivation versus cultivation by hired labor, though these elements may be present. Land-tenure conditions as a criterion for high or low standards of living may sometimes be overemphasized at the expense of more important factors. The first step toward improvement must be a correct analysis of the problem.

Side-Line Occupations Off the Farm

On many small farms only about half the cash income of the farm family comes from the farm business. The remainder is earned by the operator or by members of his family in occupations off the farm. In addition to the cash income obtained from the farm and income obtained in outside occupations, the small farm itself furnishes food, fuel, housing, etc. But all these sources combined commonly do not provide a satisfactory living. Often the difficulty is increased by the farm operator's pessimism as to the possibility of getting more income from the farm itself. He is not generally as quick to take advantage of scientific methods as is the larger farm operator. Yields per acre, per cow, per hog, or per hen on the small farms of the United States average lower than on the larger farms, whereas in certain European countries the opposite is the case. Too often,

moreover, the economic efficiency of the farm family is impaired by lack of adequate opportunities for education, recreation, and the preservation of health.

Further study of the small-farm problem as a whole is urgently necessary. A rough classification of such farms seems practicable and indicates the application of different remedies in different situations. (1) We may distinguish small farms whose earning power can not be materially increased through soil improvement or improved management. (2) There are numerous small tenant or cropper farms which form parts of a large holding or plantation. Often the soil of such farms can be improved materially and their production increased by efficient centralized supervision. (3) There are many small farms operated by their owners, the soil of which could be materially improved and upon which a better farm practice would bring much better returns. Then there are small farms that furnish a fair living place and some food, fuel, and other necessities, while permitting members of the farm family to work at outside jobs.

Different Remedies Required

These different kinds of small farms obviously call for different means of increasing their power to furnish a satisfactory standard of living. Farm management and marketing methods should be adapted specifically to each type. It should often be possible to encourage the development of rural industries adapted to the part-time employment of the small operator and his family. In certain areas where the economic operation of small farms is impracticable, State agencies should discourage the small farm. On the other hand, it is well to recognize that a place exists for the small farm providing a lower all-round income than the larger farm usually produces, since many families may do better on such small farms than they would anywhere else.

Effective action to raise living standards on our small farms is necessary, not only in the interest of the farm people immediately concerned, but in the interest of the Nation. These farms are a source of population as well as of food supply. They send their surplus population to the towns and cities. Hence the entire Nation suffers when living conditions on the small farm make it difficult to rear and educate young people adequately there. Not agriculture alone, but our entire national life stands to benefit from whatever may be accomplished toward the establishment of a satisfactory standard of living on the small farms.

AGRICULTURAL EXPORTS

Total exports of agricultural products, excluding forest products, amounted to \$1,847,567,000 in the fiscal year 1928-29, an increase of about 2 per cent over the previous year. Gains were made in the exports of cotton, tobacco, pork products, fruit, and feed grains. Shipments of wheat declined. Agricultural exports in the past year made up only 33 per cent of our total exports of all commodities, the smallest percentage, with the exception of that for 1917-18, on record.

Exports of cotton during 1928-29 increased about 7 per cent over those of the preceding season. Great Britain, Japan, and Italy took substantially larger quantities of American cotton but exports to Germany, France, and Russia declined. The present season opened with activity of foreign cotton mills as a whole apparently on a lower level than last year. Our exports of wheat declined about 25 per cent last season as compared with 1927-28, in spite of a somewhat larger wheat crop. There was increased competition from large wheat crops in Canada and the Southern Hemisphere. Moreover, increased European production of wheat in 1928 reduced Europe's import requirements. Exports of corn, barley, and oats in 1928-29 were materially above those of the preceding year, largely because of an improved European demand following a poor harvest of feed grain crops in Europe.

Exports of flue-cured tobacco, which now constitute almost three-fourths of our total leaf-tobacco exports, increased 26 per cent over those in 1927-28. The increase was due almost entirely to the fact that very large shipments were made to China during the last six months of 1928 in anticipation of higher import duties. Exports of flue-cured tobacco to China in the first half of 1929 were much smaller. Exports of air-cured and fire-cured tobacco were smaller in 1928-29 than in 1927-28, and the outlook for future exports of these types is not so favorable as for flue-cured tobacco.

Increased Exports of Pork Products

Fewer hogs and reduced pork production in Europe resulted in larger exports of pork products and lard from the United States during the last fiscal year. Exports of cured pork increased 3 per cent and those of lard 9 per cent. The increased quantities of pork were exported at higher prices. Lard prices, however, were lower than in 1927-28.

Exports of fruit increased largely last season. Shipments of boxed apples to foreign markets were the largest on record. Exports of barreled apples were close to the record figure attained in 1926-27, when the crop in the eastern barreled-apple States was much larger than that of last year. Poor apple crops in Europe resulted in greatly increased takings of American apples by continental markets. Exports of oranges and grapefruit continued to increase. Shipments of California oranges to Great Britain during the past spring and summer were unusually heavy. A record production of prunes and raisins in 1928 contributed to a further expansion in the exports of these products. Some of the increase in the prune exports was due to reduced competition in European markets from Yugoslav prunes.

THE TARIFF

It has come to be more generally recognized in recent years that tariff protection for the farmer is a necessary part of a sound national agricultural policy. American agriculture was formerly more dependent on foreign market conditions than it is to-day; and many students doubted whether tariffs could be effective on farm products. It is a truism that goods produced largely for export usually have their prices determined in the export trade.

Since 1900, however, agricultural exports have been a diminishing part of our total agricultural production. From 1924 to 1926, inclusive, the value of our exports of animal products and of crops not fed to livestock was only 16 per cent of the value of our total production of such products, whereas it was within 24 per cent for the period 1899 to 1903. Simultaneously our imports of agricultural products increased. On the other hand our industrial exports became an increasing part of our industrial production.

American agriculture is still far from being on a domestic basis, and will undoubtedly have large quantities of certain products to export for many years. Nevertheless, it can profit increasingly from tariff protection. This is true even of crops that are quite largely exported. Hence the consideration by Congress of a tariff bill providing substantial increases on the duties of many agricultural products is a happy augury. This Nation is committed to the protective principle. The tariff legislation in prospect, coupled with the trend in our foreign trade, promises to make that principle more effective for agriculture. There is no need to discuss the tariff schedules proposed. It is sufficient to point out that agriculture benefits substantially from existing duties, and can use increased protection. The tariff conspicuously assists producers of flax, cane and beet sugar, fruit, beef cattle, sheep and wool, and dairy products. Our beef-cattle industry has been on a domestic basis for years. Under the protective policy our sheep industry, though faced with keen foreign competition, is expanding. Our dairy industry has shifted from an export position to one in which it barely meets domestic requirements. It can thus benefit materially by import duties on its principal products. Without tariff protection the price of butter would be materially reduced in the season of low production in the United States, and the incentive for production in that season would be diminished. Though we export large quantities of lard and other pork products, and import only small quantities, tariff duties on these products can give some protection against imports from Canada. Duties on vegetable fats and oils can protect the domestic market for lard indirectly, and to some extent the domestic market for other pork products. Such duties can also protect the producers of cottonseed and dairy products.

Tariff Protection on Corn and Wheat

Tariff protection can be effective on corn and wheat, though our imports of these commodities are small. Duties on corn can protect the coast markets against Argentine corn, particularly in seasons when the Argentine crop is large. Without such protection corn can not be shipped in such seasons from our corn States into coast markets in competition with corn from Argentina. Tariff protection is effective on wheat when the Canadian crop is large and the United States spring wheat crop is short. Even our cotton industry can be benefited by a protective policy though we export half our cotton. Protection against the importation of long-staple cotton would strengthen the domestic market for the longer American staples. In short, agriculture is by no means on a world-market basis exclusively, but is well placed to share the benefits of our protective system.

HELPING THE FARMER LOOK AHEAD

Increased attention was given to the issuance of economic information in a usable form. It is now six years since the department began its system of outlook reports as an aid to farmers in adjusting their production. In the main these reports necessarily present a national rather than a local point of view, and need to be supplemented with regional and local information. Accordingly, the outlook work as now conducted involves close cooperation between Federal and State research and extension workers, so that data about main trends in production and prices may be related to the requirements of particular farms. Not all the producers of a given commodity should increase their production when the prospect is for favorable prices, nor should they all curtail their output when the prospect is less favorable. Much depends on whether the individual farmer's costs of production are relatively high or relatively low. It is therefore necessary to combine general economic information with farm-management studies. This has been done extensively of late with gratifying results.

In the preparation of the national outlook report, workers from every State participated. Some States had several representatives at the outlook conferences in Washington. In turn members of the department cooperated with State economists and extension officials in drawing up regional applications of the main report. Thirty-eight State agricultural colleges issued State outlook reports. Federal economists also cooperated with county agents in interpretations of the outlook material on a county basis. Economic charts proved effective in promoting better adjustments of production. Some idea of the scale on which the outlook extension work was conducted is given by the fact that 250,000 copies of the national and 215,203 copies of the State outlook reports were distributed. More than 2,500 outlook extension meetings were held, through which more than 100,000 farmers were reached directly and thousands of others indirectly. Outlook information was also distributed in a national radio broadcast including 32 stations. The widespread interest shown in the reports is indicative of the use made of outlook information by farmers.

Budgeting in Wider Use

Budgeting as a method of shaping farm-production programs was brought into wider use. By this method, Federal and State extension workers draw up programs for typical farms with prospective receipts and expenses estimated and compared with similar figures for other programs. Thus farmers can decide what to grow, with increased understanding and confidence. Attention was given also to the forecasting of production trends over a period of years, as a basis for long-time farm programs. This work called for studies of the foreign production and the foreign consumption of hogs, wheat, cotton, and other crops much influenced by world conditions. Necessary data were obtained from the department's representatives in foreign countries, from the State Department's consular service, from the International Institute of Agriculture at Rome, and from foreign ministers of agriculture, and other official sources.

Additional facilities for gathering foreign information, however, would have been very useful. World competition in some agricultural products has increased in recent years. If the farmers of the United States are to work out definite long-time programs on a sound basis, they need much more information about conditions abroad than is at present available. Changing European production is vitally important in the hog market. In the wheat market, trends in foreign acreage are as significant as trends in acreage here. It is the same with cotton. When India increases its production of cotton, or consumers change their demand for various staples, the American grower needs to be quickly informed. A stronger foreign agricultural service, with specialized research workers, would greatly facilitate the department's efforts to help farmers in planning ahead.

Increased appropriations for reporting on fruit and vegetable crops enabled the department to issue new outlook reports dealing with these commodities last year. Several will be issued during the crop year 1929-30 on such special crops as early potatoes, lettuce, and canning crops. The extension services of Virginia, Maryland, and North Carolina are cooperating with the department in a special study of the early potato situation, which promises to have great practical value. Extensive publicity will be given to the department's intention to plant reports regarding potatoes. Arrangements have been made for cooperation with growers, producers, cooperative organizations, and national distributors in an effort to effect a better adjustment of the early potato acreage.

An Example in a Tobacco Area

How farmers may increase their income by adjusting their production to changing market conditions was recently demonstrated in the tobacco belt of Virginia. A few years ago farmers in this area produced dark tobacco of a type which faced a steadily declining export demand. Analysis of the market situation and of farm-management conditions on individual farms was made by representatives of this department in cooperation with the Virginia Polytechnic Institute. As a result, certain changes were recommended to the farmers concerned. Eight men who changed their operations accordingly increased their net earnings from less than \$800 a year to more than \$1,100. Four men ignored the recommendations, and the incomes of these men declined. This striking illustration of the practical value of economic studies combined with farm-management analysis impressed many near-by farmers and led to additional favorable changes in farm organization. Similar illustrations could be cited for other regions.

SHIPPING-POINT INSPECTION

Inspection of fruits and vegetables at shipping points increased by 18,367 cars during the last fiscal year, making a total inspection of fruits and vegetables of 266,831 cars. In addition, 5,202 cars were inspected at receiving points. Handlers and receivers of large quantities of fruits and vegetables, such as cold storage and express companies, made increased use of the inspection service, and inspection

for large terminal organizations grew rapidly. Inspection of dairy and poultry products increased slightly. Grading of hay and inspection of the graded shipments was made a regular service at 25 commercial points and 33 army posts, and the volume of the work increased materially. A seed-verification service, begun the previous year, covered the product of 60 commercial firms, and offered a valuable safeguard to purchasers of certain seeds. Use of the inspection service for soybeans by large crushers greatly increased. Demands for the classification of cotton increased also. The number of bales classified (exclusive of reviews) was 446,181 compared with 137,695 the previous year. Grain-inspection supervision was supplemented by a campaign to bring about a better understanding of the standards on the part of country grain dealers, and all previous records for the handling of appeals were broken. Grading and stamping of dressed beef was done in eight market centers, where 58,571 carcasses were graded and stamped.

MARKET-NEWS SERVICE

The market-news service was carried to several areas not previously reached. The southern circuit of the leased wire was extended to Montgomery, Ala.; Nashville, Tenn.; Jackson, Miss.; and New Orleans, La., where market-news offices were opened in cooperation with State agencies.

In the West a leased-wire drop was added at Sacramento, and in the Northwest the wire was extended to Portland and Corvallis, Oreg., Seattle and Spokane, Wash., and Boise, Idaho. In cooperation with several State agencies, distributing offices were opened to issue reports on the principal farm products of the several areas. Offices at Cleveland and Detroit were connected with the main line of the leased wire. With a few further extensions, the leased-wire service will carry the market news quite generally to the important markets and distributing points.

Statistical Charts Widely Used

As an aid to the States, the Bureau of Agricultural Economics prepared a series of over 100 charts presenting statistical data needed in local outlook meetings. These charts were issued in large wall-chart form. More than 3,000 copies were distributed for use by extension lecturers. Special chart books were also prepared as well as other literature to supplement the outlook statements. Economic publications designed particularly for extension workers were more used. Though these publications were trebled in number, the demand was not satisfied.

A recent survey showed that 287 research projects were under way in the Bureau of Agricultural Economics. Most of these concerned farm management and costs, statistical research, cooperative marketing, land economics, and agricultural finance and marketing.

Among the newer projects were a number relating to the analysis of the factors affecting the prices of wheat, corn, wool, butter, potatoes, tobacco, cattle, and fruits. This form of research is of primary importance in connection with outlook work and in the development of plans for marketing.

DEMAND FOR HIGHER-QUALITY PRODUCTS

Significant among recent developments in agricultural marketing is an increased demand for the higher-quality products. Such products bring higher premiums over ordinary or low-grade commodities than they formerly did. In fact, the lowest grades of some products are disappearing from the markets, as no longer worth handling. More general standardization and inspection of products have induced both producers and traders to pay more attention to quality. But the premiums offered for superior-quality goods in the central markets are not always reflected in the prices paid to the producers. Investigations to determine how this may be remedied are now under way in the department, and some practical developments have resulted.

Studies during the last year have sought to show precisely what determines good quality in different farm products, what qualities are in the greatest demand, and what quantities of the different grades are commonly produced. Some of the studies have followed products through market channels to the consumer. The distribution of peaches, prunes, honey, rice, and other commodities has been analyzed to reveal consumer preferences, and methods followed in the wholesale and retail markets have been observed. In this way a foundation has been laid for practical recommendations as to the production of better-quality goods. Farmers are not always rewarded in proportion to the effort they exert in the production of high-quality goods, but improvement in marketing methods and in knowledge of consumers' wants tends to bring about a more equitable reflection of quality differences in price differences.

Perhaps the best-known example of systematic effort to make country markets more sensitive to quality differences in farm products is the department's cotton grade and staple estimating work. The primary object of the grade and staple estimates is to indicate profitable opportunities for the production of better-quality cotton. Such opportunities depend of course on the degree to which quality production is encouraged by cash rewards. Farmers will not produce the kind of cotton demanded by the mills, even when they are in a position to do so, unless it pays them better to grow that kind of cotton than to grow any other kind. Heretofore the grower of superior fiber has often had to take a price no better than that received by his neighbor for inferior cotton. The department's grade and staple estimates should help eventually to overcome this drawback by facilitating the assembling of good cotton at country points in commercially significant quantities.

Premiums for Quality in Meat Animals

Studies of the value of meat animals, particularly cattle, are under way which will enable the department to advise livestock raisers regarding the most profitable types. For the year 1928 the average price of Choice and Prime steers at Chicago was \$15.82 a hundred pounds. In the same season the average price for Common steers was only \$10.76. The difference of \$5.06 was purely an expression of quality difference. It does not follow of course that a similar

spread would prevail should the production of the better grades be relatively increased. However, room certainly exists for the profitable production of more choice cattle. The relative quantities of the various qualities of cattle that the market will absorb readily are being investigated to enable the department to advise farmers what *type of animals to put in their feed lots*.

Though increased egg production has been accompanied by a general decline in the level of egg prices during the last few years, each season has seen a better quality of eggs marketed. It has also seen a widening of the spread between the prices of good-quality and the prices of poor-quality eggs. Fresh eggs of the best quality sometimes sell in New York in the winter months for double the price of low-quality fresh eggs. However, the depressing effect of heavy low-grade production affects the prices of all eggs. The department is endeavoring to lessen this influence by encouraging the better handling and the closer grading of eggs at points of production.

More laboratory facilities for protein testing are required, so that the protein content of wheat may be more accurately reflected in prices at the farm. As is well known, the quality of wheat for milling depends largely on its protein content, and high-protein wheat is usually sold at a premium. It is therefore very important to measure protein content as a market factor. The testing must be done in well-equipped laboratories. Though private and commercial laboratories, and in some cases State laboratories, afford considerable service of this kind, the demand is not yet adequately met. A much more general testing of the crop for protein is necessary if the full value of the grain is to be reflected in the prices paid to the producers. It is therefore gratifying to report that Federal legislation to meet the situation has had favorable consideration in Congress.

LAND UTILIZATION

Much of the economic hardship suffered by farmers has been caused by too rapid expansion of the area devoted to farming. The eagerness of land-owning interests and selling agencies to induce farmers to occupy undeveloped areas, public encouragement to land settlement, and other influences have contributed to overrapid agricultural expansion in this country.

Our public-land laws and policies have favored expansion. Many millions of acres of Federal land in the Great Plains and intermountain regions were occupied in the years preceding 1921. Expansion through homesteading was brought practically to an end only by the virtual exhaustion of the supply of public land suitable for farming outside of areas requiring irrigation. The policy of the Government in exempting settlers on Federal reclamation projects from payment of interest on construction costs has also stimulated expansion.

Expansion has been misdirected as well as overstimulated. Additional crop land has been brought into use through drainage projects undertaken without due consideration of the comparative advantages, private and public, of reserving the areas as refuges for wild life. The drainage of marshes and shallow lakes has greatly reduced the area available to wild fowl for breeding, feeding, and resting, and

necessitated a Federal program to conserve marshland for migratory birds. Much inferior land has been occupied by settlers unfamiliar with local conditions and with the physical characteristics of the land, and unaware of the handicaps they were assuming. Some of these settlers have been overpersuaded to purchase tracts better suited at present to forest uses than to tillage. One of the major causes of the postwar depression in agriculture was previous over-expansion under the stimulus of war-time influence and of public and private land policies.

The remaining area physically capable of use for crops, but not at present so used, amounts to nearly a third of the total land area of the continental United States, and exceeds the area in harvested crops. This land is mainly of inferior quality. Much of it would require expensive clearing, drainage, irrigation, or soil improvement. It is mostly in private ownership. Though a large acreage is within the boundaries of existing farms, extensive holdings are owned by lumber or mining companies, railroads, and land companies. Since ownership involves outlay for taxes and other charges, many owners are impelled to promote the utilization of the land for farming. The desire of local communities and of local business interests for development reinforces the tendency to press the land into use.

Lands That Should Be Farmed

Lands not yet brought under cultivation but capable of making a good return on the development cost and a good permanent living for the farmer occupants should be farmed. To try to prevent it would be ill-advised. The urge to settle, and the community and private interest arrayed on the side of development, are bound to extend cultivation to new lands of this character. That the result may force lands elsewhere out of use is not a valid reason for opposing the new development.

The remedy for overextended agriculture is to curtail production, and the place to curtail is where returns are lowest. The problem is two-fold: To hold expansion in check where it would extend cultivation to marginal and submarginal lands, and to get lands of this character out of cultivation.

The per capita land requirements of the Nation for agricultural production are being reduced by the substitution of mechanical for animal power and by various economies in crop and livestock production. Furthermore, the rate of increase in our population is declining rapidly. A sound agricultural policy would help to prevent the waste of effort involved in the cultivation of farms where basic physical conditions or general economic conditions, or both, are unfavorable. Such a policy would seek to relieve the farming industry from the depressing effect of misdirected effort and misplaced farms.

Many farms that are now submarginal were established by hardy pioneers when agriculture was largely noncommercial. The passing of game and merchantable timber, the progress of soil erosion, the competition of commercial farming in the West, the attraction of other occupations, and the demands of higher living standards have made thousands of these farms obsolete. This condition is found particularly throughout much of the Appalachian region from Maine to Georgia, including the plateaus on the west, in the region

known as the Highland Rim, in the Ozarks, and in some of the western mountain areas. Some areas formerly adapted to commercial-crop production have sunk below the economic margin chiefly through soil depletion or erosion. A combination of soil deterioration and boll-weevil damage has made much land essentially submarginal in parts of the old Cotton Belt. In other areas, such as parts of the northern Lakes States and various parts of the Atlantic and Gulf coastal plains, relatively infertile lands have been occupied, the cultivation of which is not justified by present conditions.

In extensive areas that have become submarginal, gradual farm abandonment is taking place. Many farmers have abandoned their farms entirely, but there are various stages of abandonment. In many instances the practice of depending in part on outside income is virtually partial abandonment. In its most extreme form, farm abandonment becomes land abandonment. This stage is reached when present and anticipated returns from the land sink so low that no one considers it worth while to pay the taxes.

Abandonment Through Tax Delinquency

The abandonment of farms through tax delinquency is most serious in regions of extensive timber holdings which, following destructive lumbering and forest fires, are similarly becoming tax delinquent. As tax delinquency increases, the economic problems of the farmers who remain and of the local communities become more acute. Migration of the forest industries as the timber is cut out decreases the population, curtails the local market for farm products, diminishes local mercantile business, and causes a rising per capita cost for schools, roads, and other functions of government. As the forests wane, agricultural welfare is depressed, and farm abandonment tends to follow.

It is therefore clear that to discourage the occupation and cultivation of lands ill-adapted to farm operation should be part of a sound agricultural policy. But the task should not be thought of as primarily preventive. To attempt merely to restrict the use of land would be wrong. It would meet with inevitable resistance, since it would run counter to many interests and to the human desire to make use of land, and it would be economically unsound wherever the productive employment of land was possible. A constructive land policy is required. The task, while large and difficult, has great possibilities for the advancement of rural welfare. It should promote economic reorganization in the regions of extensive submarginal farm lands.

The three great forms of use to which all but an insignificant proportion of our land area can and must be put, if the land is used at all, are tillage, pasturage, and forests, including parks or wild-life refuges. It is necessary to determine, as nearly as possible, what lands are best suited to each of these uses or to their various combinations.

Forest use should be developed to make it a more efficient form of land use. Intelligent forest culture is required. A serious shortage of timber can be prevented only by extensive reforestation, particularly near the principal centers of consumption in the East and

South. Probably less than one-half our present forest area is satisfactorily stocked with growing timber of merchantable species. Even if all of the area of forest and cut-over land, approximately 470,000,000 acres, were growing timber under effective fire protection and intensive forest management, the annual growth would only about equal the present consumption.

Uncertainty as to Land Uses

More adequate reforestation is retarded by uncertainty as to the most economical utilization of particular areas. Much vagueness exists as to what lands might be economically farmed. It is not clear what lands could profitably be reforested by private enterprise and what lands will have to be reforested, if at all, by public agencies. The investigation necessary to settle these questions is highly complex, and usually requires facilities beyond the reach of the average landowner. Local interests generally lack the perspective needed to determine a policy of utilization consistent with national interest. Public action, such as changes in the tax system, is required to modify the basic conditions of land utilization in many localities.

These considerations point to the need for a public policy of economic land classification. This department has made several local land-utilization studies, mainly to test various methods of land classification. Several States have made inventories of their land resources. But more comprehensive land classification should be undertaken. Many aspects of the problem of promoting effective land utilization are national. Land classification on a national scale should be begun by the Federal Government, with the fullest possible participation and cooperation of the States.

The basis of such a classification would be definite information concerning the physical characteristics of various types of land. Physical and economic information thus assembled and organized would make it possible to determine whether areas of impoverished or decadent agriculture could be restored to prosperity by a reorganization of farming. For farming areas which could not be thus restored, the determination of the fact would indicate the true course to follow. It would also facilitate a program of regrouping population in sparsely settled areas so as to economize expenditures for schools, roads and other utilities. The economic possibilities of areas hitherto not employed for agriculture might also be determined.

Early Attack Essential

What can be done and should be done immediately is to recognize that there is a great problem of land use, that an early attack upon it is essential, that research is needed in diversified fields, and that it should be carried on systematically under a unified plan of coordinated action. Forest research, for example, should not be confined to study of the forest itself and of methods of managing and protecting forest lands so as to obtain the largest yields of forest products at lowest cost. Market requirements and possibilities are quite as important as management methods. The landowner needs to know what to grow as well as how to grow. New ways of utiliz-

ing forest products may open new requirements for raw material. Improved methods of manufacture may raise the value of stumpage. Economic and industrial studies are integrally a part of the program necessary for furthering right land use.

To determine the best form of use for lands of various classes and types, in all parts of the country, and the practices necessary to obtain from each class and type of land the highest yield of the most desirable kinds of products is a very large order. But in addition, sound, forward-looking public policies will have to be formulated and put into effect. It is impossible to do more now than suggest in a very general and fragmentary way, what an adequate public policy designed to promote efficient land utilization should include. Undoubtedly such a policy would make necessary substantial changes in taxation policies and methods. For example, present tax laws in many States are operating as a strong deterrent to reforestation on the part of private owners, and in some States have led to stripping the land of everything salable followed by abandonment through tax forfeiture. The public is thus saddled with responsibility for the land under conditions which make its restoration to productiveness a slow, difficult, and expensive process.

Again, public aid and encouragement to the adoption of desirable forms of land use, and to the adoption of methods that will make such use possible, will need to be extended through cooperative and educational activities. The public task will have to include extensive public ownership of lands that can be made to serve their higher purpose in no other way. Already there is extensive public ownership of this kind. It is partly Federal, partly State and municipal. Public ownership is necessary in order to (1) protect watersheds and prevent soil erosion, (2) conserve timber and grow forest crops, (3) provide for public recreational needs and preserve unspoiled for public enjoyment natural beauties and scenic resources, (4) determine and demonstrate to private owners methods of handling similar lands profitably without lowering or destroying their value, and (5) preserve and utilize forest-land resources that are not attractive to private investors. Public ownership for these purposes is being extended, and public sentiment seems to be in favor of doing still more.

Public Purchases of Submarginal Lands

There is marked interest in the possibility of aiding the stabilization of agriculture by public purchases of submarginal farm lands, with a view to their conversion to timber growing. Such purchases would no doubt be largely confined to mountainous timbered regions where a large percentage of land is already in woodland and the farms are largely limited to small patches of tillable soil, often rocky, frequently subject to erosion, and not adapted to cultivation with modern power-driven machinery.

A policy of submarginal land acquisition would aid in working out the problem of flood control. One of the reasons for establishing the western national forests was watershed protection. These forests, created from the public lands of the United States, cover the mountains of the region. In the East the Federal Government has been acquiring forest lands by purchase, primarily for watershed

protection, for nearly 20 years. The lands thus acquired are also mountain lands, protecting portions of the headwaters of a number of the principal navigable rivers. They are under administration as national forests. The total area acquired or approved for purchase from the passage of the Weeks law, in 1911, to the close of the fiscal year 1929, was 3,604,898 acres.

It is a great misfortune for the East that almost all its forest lands had passed into private ownership before the national-forest policy was inaugurated. Except in Arkansas, Florida, Minnesota, and Michigan, no considerable acreage of public domain forest lands was left that could be reserved and put under Federal administration. With some small scattered remnants of similar lands in other States, a total of 2,230,735 acres has been set aside for incorporation in the eastern national forests. The transfer of certain Federal lands that were being held for other purposes, and land acquisition through exchange have added 224,789 acres. Including lands acquired or in course of acquisition through purchase, the eastern national forests now contain 6,060,336 acres of Federal lands.

The States in the East own 5,000,000 acres of land that are either under public administration for forest and park purposes or are being held with a view to their administration or possibly their exchange as a means of blocking up administrative units. Virginia, North Carolina, and Tennessee are acquiring lands preparatory to their gift to the Federal Government for administration as the Shenandoah and Great Smoky Mountain National Parks, with a contemplated minimum area of 755,000 acres. County and town forests in the Eastern States approximate 500,000 acres. Yet all the publicly owned lands in the East that have been set aside or acquired with a view to their permanent public administration make up less than 4 per cent of the total eastern forest area. The public welfare requires a much greater percentage than this.

Public Ownership for Timber Production

The use of land for timber production as an alternative to nonuse is in large part the crux of the forestry problem in the East. In the belief that the self-interest of private owners could be relied upon to work out the most desirable form of use and to apply the methods that would make the land yield most, the Federal Government and the Eastern States alike long pursued policies of land disposal. Contrary to the early expectation, private ownership has brought a lowering of the productive value of large areas, and no small amount of actual land wreckage. When private ownership becomes no longer attractive, the land reverts to public ownership via tax forfeiture—an evil that will increase greatly unless public policies are altered. Even though the land remains in private hands, it may become and often has become a menace to the public welfare. The chances are that a substantial percentage of the 335,000,000 acres of privately owned forest land in the eastern half of the United States will eventually have to be acquired and administered as public-forest properties. National, State, and local community interests are all involved. All should share in the task; and unless all do energetically share in it, there can be no expectation of its satisfactory accomplishment.

The movement for county forests is a very recent development. It has important possibilities in some States. Town forests, too, are increasing rapidly in number; the oldest dates, it is said, only from 1914; yet several hundred are now in existence. While their purpose will for the present doubtless in most cases be primarily either to protect city water supplies and local scenic areas or to provide public recreation grounds, they may in time become increasingly the source of wood supplies harvested for revenue and a factor by no means negligible in bringing about the return to public ownership of a reasonably large acreage of the eastern forest lands. In Switzerland two-thirds of the forests are municipally owned. In this country, however, the major share of the task of public ownership will unquestionably have to be assumed by the States and the Nation.

States' Interest in Forestation

In some ways the States are more immediately concerned than is the Federal Government in preventing deforestation. The loss of property values and the decline in public revenues which exhaustion of the forest resource entails, if development of the land through other uses does not follow, affect most severely the localities and the States. Upon the States rests the responsibility to adopt land and forest policies to prevent their impoverishment through the vanishing of their timber resources. They have the police power necessary to restrict abusive practices and to prevent forest-land denudation; they have the power to adjust taxation so that it will not operate as a deterrent to timber growing; they have the power to take over and administer tax-delinquent lands; and they have a strong incentive to use these powers to prevent economic retrogression. But many of the States are wholly unable to assume the cost of acquiring and reforesting extensive areas of deforested land. This is true particularly in the States where forest destruction has been most general and reforestation is most urgent. The financial exigencies of such States or of their local political units are leading them to look with disfavor on any course that will tend to remove land from the tax rolls.

It is worthy of thought whether a program of Federal aid to States for the purchase and reforestation of lands by the States themselves would not prove valuable. The Federal-aid principle has been established in connection with the highway program and has proved a very stimulating influence in the construction of roads. A program of Federal aid to the States for forestry might prove equally valuable. All the resources now appropriated by the Federal Government for forest-land purchases must be employed in the prosecution of the program as outlined in existing laws. That program includes the purchase and administration of lands by the Federal Government for the promotion of timber production, as well as primarily for the protection of navigable streams. It is believed, however, that in the two forest regions of the East in which the greatest need exists—the Lake States and the South—purchases for the former purpose should be directed primarily to demonstrating the practices necessary for successful timber growing by other forest owners, private and public, and at keeping in pro-

duction forest lands which can be made to pay for protection and management only under Federal ownership. Through such activities examples will be set that should have a very powerful regional influence, and lands that would otherwise be a local liability may be made a local and national asset.

Policy of Federal Acquisition

The policy of Federal acquisition was established by the Weeks law, in 1911. Under this law purchases were limited to lands needing to be kept in forest for the protection of navigable streams. The law provided also, however, that the acquired lands should be permanently administered as national forests. The Clarke-McNary law broadened the purpose of acquisition to include specifically the promotion of timber production. The purposes of Congress, therefore, include not only the acquisition of lands needed for the protection of navigable streams and for continuous timber production to meet public requirements, but also the extension of national-forest administration, which aims at the coordinated development and use of all the forest resources, including recreational and wild-life resources; and beyond that, there is the purpose to aid in solving the forest problem of the United States.

So far, 36 separately designated units, situated in 17 States, and containing a gross area of 13,598,332 acres, have been approved as purchase areas by the National Forest Reservation Commission. Within these purchase areas the Federal Government now owns 6,060,336 acres. Of the remaining 7,537,996 acres, approximately 80 per cent, or 6,023,200 acres, eventually should be acquired. The National Forest Reservation Commission has indorsed a further program, formulated by the Forest Service, which contemplates the establishment of 23 new purchase areas with an approximate gross area of 3,035,000 acres, of which 90 per cent should be acquired.

On the basis of the past average cost of purchase, the full program will, if its completion is authorized by Congress, entail an expenditure of approximately \$50,000,000. This purchase program does not anticipate such action as Congress eventually may take with reference to the establishment of forests as features of the Mississippi River flood-control program, or for agricultural relief through the withdrawal of marginal or submarginal lands from crop production, or for protecting the projected system of inland waterways, though some of the land included in the program is on the drainage of the Mississippi, and some of it is marginal or submarginal land hitherto cultivated, or which may be cultivated if not acquired for forest purposes.

Experienced Personnel Required

A minimum organization of skilled and experienced personnel must be maintained to handle acquisition work efficiently and economically. Urgent need exists for the enactment by Congress of a specific fiscal program and policy extending over a sufficient period of years to guarantee continuity and stability of plans and organization. This need was recognized in the original Weeks law, which not only authorized but made appropriations for a 5½-year period.

It was recognized again in the Woodruff-McNary bill, which as it passed the Senate authorized appropriations of \$40,000,000 over a period of 10 years, and as finally enacted authorized appropriations of \$8,000,000 over a period of three years. The Woodruff-McNary authorization will expire with the fiscal year 1931. Prior to its expiration a new fiscal plan and program is needed which will afford a basis for the future planning and prosecution of the purchase work.

SOIL EROSION

A problem urgently needing study in connection with the working out of efficient land use is soil erosion. That soil erosion is a national menace is now recognized. The appropriation by Congress of \$160,000 for its study is an evidence of this recognition. The losses resulting from unrestrained erosion amount to many millions of dollars annually. There is evidence to indicate that the direct loss to the farmers of the Nation is at least \$200,000,000.

The work of the Soil Survey of the Bureau of Chemistry and Soils, the investigations conducted by the Bureau of Public Roads, and the forestry and range-management studies carried out by the Forest Service have all served to indicate the wide extent to which the lands of the United States have been subjected to destructive erosion. A single county in the Piedmont section of South Carolina was found by actual survey to contain 90,000 acres of land formerly cultivated which has now been permanently ruined by erosion. In another county in the Atlantic coastal plain of Georgia, 60,000 acres of formerly fertile soil was found to have been washed and gullied beyond repair. In the brown-loam belt along the Mississippi River, many counties have been found to contain 10,000, 20,000, or 30,000 acres of land that have been ruined. Agriculture has been largely driven out of the uplands in this region by reason of destructive and unrestrained erosion. Also large areas of good alluvial land have in many cases been buried beneath infertile sands washed out of the upland gullies. Stream channels have become so choked with erosional debris that overflows have become exceedingly common, and large tracts of formerly productive soil are now being classed as swamp land.

The erosion problem has two aspects. One concerns the loss of soil fertility and soil material caused by the run-off. It is not the plant food alone that is removed by rain wash, but the solid soil material itself. The plant-food elements removed from the soil by growing crops can be restored in the form of fertilizers and manures, but the soil that is washed from the fields can not be restored except by natural processes that require centuries. When the mellow topsoil with its valuable humus and nitrogen is gone, there is exposed in its place the subsoil, which is less productive, less permeable, and less absorptive of rainfall. Usually this exposed material is heavier than the original soil, stiffer, and more difficult to plow.

Other Aspects of the Erosion Problem

The other aspect of the erosion problem concerns the consequences in the form of stream pollution, swifter run-off, and the eventual disposal of the soil and rock material carried away. Erosion causes

the silting of streams, reservoirs, and irrigation ditches, and the destruction or serious impairment of alluvial agricultural lands by overwash of sands and gravel.

This second aspect of the erosion problem makes it a part of the problem of flood control, in the solution of which forests have a place. Forests are one of the means of holding erosion in check. They are also a means of utilizing for timber production lands that have ceased to be cultivable through gullying or surface wash. Millions of acres both in the more hilly farming regions and in regions where the character of the soils makes for rapid erosion should be forested in the interest both of erosion control and of the best land utilization. It is in those parts of the East where rough and broken topography, steep slopes, thin soils, and to some extent high elevation make successful farming impracticable, except on limited areas with especially favorable conditions, that the maintenance of good forest cover is most urgently necessary from the standpoint of watershed protection and flood control for the country as a whole.

The present area of forest land in the United States is approximately 470,000,000 acres. On at least 75 per cent of this area the forest is a factor, often of paramount importance, in the prevention of erosion or the regulation of stream flow. On a very large additional area, probably aggregating as much as 50,000,000 acres, from which forests have been removed, erosion has become so serious that possibly the only practical remedial measure is reforestation. On at least three-fourths of the 100,000,000 to 150,000,000 acres of chaparral, woodland, and brush-covered areas, located primarily in the West, it is probable that either the erosion or stream regulation influences of the vegetative cover, or both, are a factor. Erosion from either water or wind is of some importance on probably 90 per cent of the area of untimbered range lands, and of serious importance on at least 50 per cent of this area. Such erosion is primarily the result of overgrazing or of unscientific grazing by domestic livestock.

The approach to the control of erosion and the regulation of stream flow on forest lands, both in research and in the practical application of remedial measures, must be through forest management, including fire control. In chaparral, woodland, brush, and range areas it must be through prevention of fires and regulation of grazing.

In the absence of specific appropriations for studies of erosion prior to 1928, various investigations have been carried on by the Forest Service, the Weather Bureau, the Bureau of Chemistry and Soils, and the Bureau of Public Roads, more or less independently and in connection with researches in closely related fields of inquiry. These studies have had to do chiefly with the relationship between forest, chaparral, or forage cover and stream regulation and erosion control in a particular region, and with the prevention of erosion by terracing and the construction of soil-saving dams.

Assembling of Data Necessary

Of first importance in the development of a comprehensive program for attacking the erosion problem is the assembling of all

available information in regard to the eroded areas in the United States, particularly their location and extent and the rainfall and other climatic data. For a number of years the Bureau of Chemistry and Soils, in connection with the soil-survey work, has accumulated information concerning the general location of the eroded land. During the past year this general information, the volume of which is large, has been supplemented by a rapid general reconnaissance survey. As a result of this work 18 distinct areas have been roughly outlined, and estimates have been made of the extent of erosion in these regions.

Public interest in soil erosion and moisture conservation led to the introduction on the floor of the House of Representatives of the following paragraph in the section making appropriations for the Bureau of Chemistry and Soils for the fiscal year 1930:

Soil-erosion investigations: To enable the Secretary of Agriculture to make investigations, not otherwise provided for, of the causes of soil erosion and the possibility of increasing the absorption of rainfall by the soil in the United States, and to devise means to be employed in the preservation of soil, the prevention or control of destructive erosion and the conservation of rainfall by terracing or other means, independently or in cooperation with other branches of the Government, State agencies, counties, farm organizations, associations of business men, individuals, \$160,000, of which amount \$40,000 shall be immediately available.

Since it was clearly the intent of the act that the problem should be attacked cooperatively by both Federal and State agencies, a committee, consisting of three representatives of the Department of Agriculture and two from State experiment stations, was appointed to formulate plans and recommendations for carrying out the provisions of the act. The provisional program worked out by the committee includes (1) continuation of the erosion reconnaissance survey of the United States and preparation of a map showing the extent and distribution of eroded areas; (2) a survey of the methods now used to control erosion and to conserve soil moisture; (3) laboratory studies of the physical and chemical properties of different soil types in relation to erosion; (4) field and laboratory studies of terraces, soil-saving dams, underdrains, and cultural methods to determine the most effective methods of preventing and controlling erosion and conserving soil moisture; and (5) field and laboratory studies of the effects of forest cover, chaparral brush, and range cover upon run-off, erosion, and stream-flow regulation and similar studies of remedial measures through forest management, fire control, and range management.

FOREST FIRES

One of the most formidable impediments to the development of wise use of our land area is forest fires. The loss of merchantable standing timber caused by fires is serious. Much more serious is the effect of fires on watersheds, the impairment and sometimes the complete destruction of soil fertility, and the deterrent results on the management of lands for timber growing. Repeated fires are the principal cause of forest denudation and the eventual abandonment of forest land as worthless. Were the fire factor eliminated, the upspringing of new growth and the maturing of trees

too small to cut when the first timber crop is removed would result in forest values that would generally make the owner wish to hold and take care of his land or would induce its purchase and use by some one else.

The Federal Government is cooperating with 38 States in maintaining protective systems. All the States with considerable forest areas, except Arkansas, have organized protection. The total area under protection, however, exclusive of the national forests is only seven-tenths the area needing protection, and the expenditures are less than half the amount estimated to be necessary for adequate protection of the entire area. Private owners contribute a varying part of the cost, in some States more than 60 per cent, in some States none.

The Clarke-McNary law authorized Federal cooperative participation in the maintenance of State protective systems up to a maximum of \$2,500,000 annually. This maximum was set on the assumption that a total of \$10,000,000 annually would be necessary for adequate protection of all the land that should be covered by the State systems, that an equal division of the cost between the public and the landowners is reasonable, and that the public contribution should be divided equally between the Nation and the States. Last year, however, the Federal Government contributed only a little more than half as much as the States. The financial situation of many of the States makes it very difficult for them to increase their expenditures materially, but an increase in the funds available for Federal allotment to them should serve, as it has served in the past, to hearten their efforts. The appropriation for the current fiscal year is \$1,400,000 as against \$1,200,000 for the fiscal year 1929.

Forest-Fire Protection Difficult

On the national forests, of course, the entire task of protection is assumed by the Federal Government. It is a task of peculiar difficulties. The West has, generally speaking, a long summer dry season. Inflammable surface vegetation and litter, coniferous timber, rough mountain country, sparse population, and inadequate means of transportation and communication all contribute to the danger of large conflagrations. The principal cause of fire is lightning, which is often without rain and which in electrical storms may start hundreds of fires almost simultaneously. The storms at times cover wide areas, reaching perhaps into two or three States. At other times they are purely local. In either case, if they start a great many fires burning at once, they impose a severe strain on the limited organization available to fight them.

With the summer of 1929 ended the twenty-fifth fire season since the national forests came under the Department of Agriculture. At the outset protection presented a superhuman task. The forests were largely unbroken, unmapped, and almost untrodden rugged wilderness. Parts of them could not even be reached by a pack train without days and even weeks of trail clearing and building. There was no equipment, no personnel trained in fire control, no experience, and little money available. The small handful of forest officers, each in charge of a very large area, fought the fires as best

they could, almost barehanded and with such help as they could pick up. Local sentiment was generally skeptical of the possibility of fire control and inclined to be indifferent to the need for it, if not hostile to the whole forest enterprise.

Fortunately the first five years went by before the protective organization was subjected to the test of the exceptionally bad fire season. Such seasons recur at irregular intervals. They are the result of a combination of unfavorable weather conditions, such as unusually protracted and severe drought, much lightning, and violent hot winds. The year 1910 brought the combination, with disastrous results. More than 4,900,000 acres of land within the national forests was burned over, with Government losses estimated at more than \$26,500,000.

Never since has even one-fourth of this loss been sustained. Seasons of unusual, if not comparable, severity were 1917, 1919, 1924, and 1926. Each taught its lesson. The weaknesses and local failures of the defensive system were carefully studied and remedial measures devised. The technic of fire fighting, the organization necessary to gather, transport, equip, and maintain on the fire line large numbers of men, the provision of material, the creation of an efficient system of detection, and the construction of an extending system of protection improvements, such as lookout cabins and towers, roads and trails, telephone lines, and firebreaks—all these and many other things have been developed progressively. The tightening up and improvement of the whole system of control is still going on.

More Protection Improvements Necessary

The area burned over in the national forests during the five years from 1910 to 1914 averaged 0.75 per cent of the total area, from 1915 to 1919, 0.6 per cent, and from 1920 to 1924, 0.29 per cent. In the 4-year period from 1925 to 1928, the comparable figure was 0.28 per cent. The public value of the resources protected and the impairment of this value that results when the land burns over call for a development of the protective system to a substantially higher level of efficiency than has yet been attained. The greatest need is for a material increase in the protection improvements, with which the forests are at present very inadequately equipped.

A constructive and promising move has been made by the Chief Coordinator and the Bureau of the Budget for coordinating the various forest-protection activities of the Federal Government. The Chief Coordinator organized early in 1927 a forest-protection board, made up of the heads of the Weather Bureau, the National Park Service, the Office of Indian Affairs, the General Land Office, and the Forest Service, to formulate and recommend general policies and plans for the protection of the forests of the entire country. On November 23, 1928, the board was established as a coordinating agency by the Bureau of the Budget. The first report of the board presented to the Chief Coordinator its conclusions regarding the action necessary to coordinate the protection against forest fires given Federal lands by the several bureaus administering them and to carry out the co-operative policy laid down by the Clarke-McNary law for protecting other lands against fire. The board was continued, and its functions were broadened to include protection from insects, tree diseases, and

rodents, and the Chief of the Bureau of Biological Survey and representatives of the Bureaus of Entomology and Plant Industry were appointed by the Chief Coordinator as additional members.

The forest-protection board, acting under the direction of the Chief Coordinator and the Bureau of the Budget, has a broad field of usefulness. The objectives of coordination and cooperation that have been thus set up for the forest-protection work of the Government as a whole and the establishment of the board as a means for attaining them are eminently desirable. That this move will lead to more adequate, better-planned, more efficiently carried out, and more consistently correlated Federal forest protection can not be doubted. It creates a most valuable instrumentality for fiscal planning.

FOREST RESEARCH

The magnitude of the problem confronting forest research, involving practically every region in continental United States and an area practically equal to that of improved agricultural land, indicates the need for systematic, orderly development which can only be met by a national program covering some such period as a decade. The complexity of the problem, involving in the neighborhood of a thousand tree species and an extreme diversity of topographic, climatic, soil, and other conditions, emphasizes the need for such a program. The McSweeney-McNary Forest Research Act meets this need. An outstanding feature of this act is its recognition of the numerous phases of forest research and their intimate interrelationship—silviculture, or the production of forest crops; the protection of growing crops and their products against fire, insects, decay, and disease; the problems growing out of the interrelationship between forest trees and wild life; the possibility of producing forage crops on forest lands as a basis for a domestic livestock industry; the problems involved in the manufacture and effective utilization of wood and other forest products; and the economic questions that must be understood in developing public and private forest land policies. Economic research in forestry has a close affiliation with the research of the Bureau of Agricultural Economics in the field of agricultural-land utilization. The problem of livestock production on forest-range lands is one of the group of related problems. Two classes of field units are recognized by this act—regional forest experiment stations, at which is being concentrated the local work of the Forest Service and other bureaus in the department, and a national forest products laboratory, at which departmental investigations relating to forest products are being concentrated. The forest research act provides for a 10-year financial program.

Research along such lines, long one of the activities of the department, should be continued and expanded. Economic studies of timber supplies and requirements, forest taxation, forest insurance, and related problems are integrally a part of the program necessary for furthering right forest-land use.

Research will improve the effectiveness of fire protection in the national forests, and also on privately owned lands. The authority for such work is contained in the McSweeney-McNary Forest Research Act, but appropriations will be required.

MEDITERRANEAN FRUIT FLY

Early in April of this year the Mediterranean fruit fly, perhaps the worst fruit pest known, was found to be well established in central Florida. Appreciation of the far-reaching economic significance of this discovery was immediate and nation-wide. It resulted in a general demand that the eradication of the insect should be undertaken at whatever cost. Several States offered to detail personnel to aid in the work.

To determine the extent of the invasion, and to start work against the pest, an emergency fund of \$50,000 was released by Florida and a transfer was made of \$40,000 of funds appropriated to the Plant Quarantine and Control Administration of this department for other objects. All available forces—State and Federal—were thrown into the task of determining the spread of the pest, of destroying fruit in infested and surrounding orchards, and of spraying trees with poison bait. State and Federal quarantines were imposed and restrictions placed on the movement of all host fruits and vegetables. This action stopped the movement of such articles from infested areas and provided for their movement from other areas under adequate safeguards.

Congress on May 2, 1929, approved a request for authority to use not exceeding \$4,250,000 of the unexpended balance of \$5,000,000 appropriated in 1928 for pink-bollworm control. This action made it possible to undertake vigorous scouting to determine the spread of the fly, and permitted repeated spraying of infested groves and other groves near by.

How the Mediterranean fruit fly entered the United States is not definitely known. It is widely distributed throughout the world, and effort to prevent its entry has been continuous since the passage of the plant quarantine act of 1912. Quarantines have prohibited the importation of known host fruits and vegetables from countries where the fly is found. Inspection at United States ports has resulted in many interceptions of infested fruit. The forces available for such port inspection, however, have never been adequate.

The first surveys showed that the fly was thoroughly established in several orchards within the town limits of Orlando, Fla., and at a few outlying points not more than 6 miles north or south. Later investigations indicated that Orlando was the starting point of the invasion. No infestations equally intense were found elsewhere. The infestation as determined by scouting during the past summer has strengthened the belief that the pest was recently introduced, perhaps during the spring or summer of 1928. Its spread can easily be accounted for by the movement of citrus fruits last season. The intensity of the infestation in a few orchards in Orlando is accounted for by the insect's high rate of multiplication.

Fly Found in 980 Localities

The fruit fly has now been found in more than 980 localities in 20 counties within the central and northern part of the peninsular portion of Florida. The area surrounding these points of infestation which has been included in control operations involves two additional counties—altogether more than 8,100,000 acres. This area con-

tains approximately 67 per cent of the bearing citrus trees in Florida. It produced 76 per cent of the 3-year average of citrus fruit moved from the State. Scouting in other parts of Florida and in the States within the Cotton Belt has brought to light no field infestation outside of the area mentioned.

The fruit fly attacks practically all fruits, the only important exceptions so far determined being watermelons, pineapples, strawberries, lemons, and sour limes. The vegetables subject to its attack are peppers of all kinds, tomatoes, eggplants, and lima beans and broadbeans. Movement of fruits, except those noted above, and of the listed vegetables is restricted by regulations. In Florida the fly has shown a special liking for grapefruit and the sour orange, among the citrus fruits, although it can propagate in all citrus fruits other than the lemon and sour lime. Other freely attacked fruits commonly produced in Florida are the guava, the fig, the Surinam cherry, the avocado, the peach, and the pear. No restrictions have been placed on the movement of fruits and vegetables not known to be attacked.

Prior to August 1 more than 580,000 boxes of citrus fruit, 3,400 bushels of vegetables, and 7,100 bushels of noncitrus fruits were destroyed. Not all these host fruits and vegetables were actually infested. They were destroyed because they had been produced in infested properties or within 1 mile thereof. More than three-fourths of Florida's citrus fruit crop had been marketed before the fly was discovered. A large portion of the citrus fruit destroyed consisted of culls and drops that would have had no market value.

Created Starvation Period

The next step was to eliminate the flies remaining in the infested district and prevent their migration. It was decided to attempt this by creating during the summer a starvation period within the infested and protective zones. The plan involved the complete elimination of all host fruits and vegetables in a stage of growth attractive to the fly and the supplying, in lieu of normal food, of a sweetened poison bait. This method proved effective, and hope of eradicating the fly is largely centered on the method. But it necessitates the cooperation of every resident of the State and the acceptance of material sacrifices. If success is to be achieved, trees or shrubs ripening fruit during the starvation period must be grubbed up or cut down and the growth of host vegetables must be stopped. It is impracticable to remove ripening fruits and vegetables from the infested areas daily or weekly. To give up cherished yard or garden plants and commercial or other plantings in the interest of the citrus industry is a hard requirement, but one that seems absolutely necessary if the fruit fly is to be eliminated.

It became apparent early in June that to carry out an effective clean-up program and to provide for the removal of all host citrus fruits in the orchards within the infested area, would demand a heavy expenditure. Estimates indicated a total cost of \$12,300,000 for the first quarter of the fiscal year 1930—July, August, and September, 1929—in which time most of the work would have to be completed. The cost of removing citrus fruit from the infested

zones was estimated at \$40,000,000 for clean-up and removal of noncitrus fruit in the protective zone at \$5,000,000. In addition there were items for administrative and quarantine enforcement, inspection, the certification of fruit, and research. To meet these needs, which totaled approximately \$15,500,000 for the fiscal year 1930, there was available a probable balance of \$3,000,000 from the original appropriation, leaving a deficit of \$11,500,000.

Expenditures on such a large scale can only be justified by a reasonable assurance that it is possible to eradicate the pest. But the menace to American agriculture would seem to warrant even greater expenditures if the desired end can be attained. The magnitude of the problem led the department to seek advice, both as to the work proposed and as to the possibility of conquering the fly, from a group of leading specialists selected from various parts of the country. In July I appointed a committee of experts consisting of Vernon Kellogg, secretary of the National Research Council, Washington, D. C.; H. A. Morgan, president of the University of Tennessee; T. P. Cooper, dean of the College of Agriculture of the University of Kentucky; Victor R. Gardner, director of the Michigan State Experiment Station; T. P. Headlee, State entomologist of New Jersey; G. A. Dean, head of the department of entomology at the Kansas State Agricultural College; and H. J. Quayle, professor of entomology at the University of California.

These specialists reported that eradication of the pest was not only practicable but an economic necessity. They recommended enlargement of the work under way and modification of the quarantine regulations so as to permit, under a system of sterilization, the interstate movement of citrus fruits from areas which previously had been considered infested. Research in this department had indicated the practicability of control of the larvæ and eggs in the fruit either by refrigerating the fruit to 28° F. or by heating it to some 110°. The committee stated that the sterilization of whole fruit could, in their judgment, be accepted as a substitute for the destruction of the mature crop in the formerly infested areas and would obviate the necessity of removing all citrus and other fruit of the coming crop. The department adopted the committee's report, and revised the fruit-fly quarantine and regulations so as to carry out the program recommended.

Substantial Appropriations Necessary

It is certain that in addition to the funds now available substantial appropriations will be needed to carry out the enlarged program for the remainder of the present fiscal year. Steps have been taken for the presentation to Congress of an emergency item, for the same objects specified in the initial appropriation of \$4,250,000. Since it was essential that the program should be started at once, by reallocation I made available to the first quarter of this fiscal year \$2,175,000 of the unexpended balance of the funds appropriated for the fight against the fruit fly.

The estimate of necessary Federal expenditures does not include those phases of the work that may possibly be done by the citizens of Florida, such as the eradication of minor hosts, and spraying and clean-up work in commercial and private orchards.

The costs incident to those phases of eradication which relate to production and handling and marketing of commercial crops are to be borne by the growers and the shippers. Certain phases of the work, however, can not be thus delegated. Accordingly the estimate provides that the Federal Government, in cooperation with the State, shall be responsible for (1) supervision of the spraying and clean-up done by owners, (2) the clean-up of wild and noncommercial lands, abandoned properties, etc., (3) the spraying of roadsides, town properties, and wild land, (4) the scouting necessary throughout Florida and other States, (5) the certification of products, (6) the supervision of sterilization, and (7) the enforcement of quarantine regulations.

I have already indicated that, prior to the discovery of the establishment of the Mediterranean fruit fly in Florida, the bulk of the 1928 crop had moved out of the State through normal channels of distribution and diversion, thus carrying the risk of spreading the pest widely. The danger to the Southern States was especially great, particularly as much of the movement was by autotruck, and included lower-grade fruit specially open to the possibility of being infested. The more western States had also been reached by bulk carload shipments of low-grade fruit.

All States concerned were notified of this risk in April, and an immediate inspection was begun by State forces of all Florida citrus fruit within their borders. An interstate conference held at Atlanta on May 16 resulted in more intensive and concerted action. Financial aid was given by the department out of the special fruit-fly appropriation. The State extension services throughout the Cotton Belt States from Texas to Oklahoma eastward were enlisted in the effort to locate and inspect all Florida citrus fruit within these States. This was of tremendous service. The immediate result was the discovery and destruction of 11 shipments of infested fruit distributed in Arkansas, Georgia, Louisiana, North Carolina, and Texas. Instances of infestation were reported from New York and Ohio. Most of the fruit which had moved into these States had been consumed, and the gravity of the situation was further modified by the absence of ripening host fruits at that period in these States. Immediate controls were placed on bulk shipments in April by Georgia and Alabama. This action practically excluded further truck movements from Florida.

Restriction of Shipments

In recognition of the uncertainty as to the extent of the spread of the pest in Florida and as a further protection to other States, Federal action on May 16 eliminated all movement of host fruit and vegetables from Florida into 18 Southern and Western States. This restricted the movement of Florida host fruits and vegetables to destinations in Northern States. Within the Northern States additional restrictions limited the movement of fruit from protective zones to a group of Northeastern States most removed from risk of infestation. A subsequent amendment to the quarantine prohibited reshipment of host fruits and vegetables originating in Florida out of the district into which the original movement was authorized.

Inspection in the Southern States was followed up by surveys throughout the summer covering the peach season in Georgia and Alabama, and generally the fruit season in all these States from Texas eastward, for the purpose of determining whether there had been any local establishment of this pest. It is gratifying to report that so far there is no indication of the establishment of the fruit fly beyond the area designated in central Florida.

The Mediterranean fruit fly has introduced the question of expenditures for its control and eradication on a greater scale than has been contemplated for any other insect pest. The expenditure of \$10,000,000 in the corn-borer campaign is the nearest approach. But in that case there was no thought of eradication. It was intended mainly to demonstrate, over parts of five States, that control of the borer was practicable by modification of farm practice. In the case of the fruit fly, the object is eradication. No one who realizes the menace of this fly to our fruit and vegetable industry will question that its eradication is worth any reasonable expenditure. In determining Federal policy in the eradication effort a long look ahead is necessary. Expert opinion has been rendered that eradication is possible. The department would seem to be fully justified in accepting this decision.

The possibility of eradicating the pest is strengthened by the results of the clean-up and spraying work so far carried out in Florida. Fly abundance and fruit infestation have been rapidly diminished, and new records of finding infested fruit and flies have become very few. In fact, for a considerable period there have been no such findings. This does not mean that success is in sight. All methods of discovery applied over such a vast area must naturally be looked upon as only partially effective. It does indicate, however, that control of the pest can be made very effective and gives hope that eradication is not impossible.

Research Work Instituted

Fruit-fly research work was instituted in Florida by the Bureau of Entomology in cooperation with the Plant Quarantine and Control Administration. This work was greatly expanded under the special fruit-fly appropriation. There is need for a further increase in this field. The results so far of immediate service have been (1) the development of a more effective type of poisoned spray to kill the adult flies in orchards, (2) the development of attractants to facilitate the collection of adult flies in orchards or elsewhere to determine presence or spread of the pest, and (3) the development of a fumigant with which to kill adult flies in motor and railway cars, buildings, or other premises.

Another important phase of research is the determination of methods for sterilizing fruit by refrigeration or heat. The department's discoveries in this field should make it possible to utilize, either by movement in commerce or in some type of processing, all fruit not actually infested. Methods have been devised for the disposal of waste and cull fruit, both in bulk from the orchards and as a continuing process in connection with packing houses. Machinery for this purpose has been devised. Methods for bulk disposal were immediately put in use, and greatly facilitated the disposal of the

infested fruit of the crop of 1928-29. Determinations made by the department as to the host relationships of fruits and vegetables in Florida were at once translated into quarantine restrictions or made the basis for the release of articles from quarantine.

EUROPEAN CORN BORER

There was no important change in the European corn-borer situation during the season of 1929. In the New England area there was a slight general increase in abundance, but serious commercial damage occurred, as in 1928, only in a limited district in Rhode Island and in adjacent Massachusetts. In this district, however, there was a notable decrease from 1928 in the abundance of the borer, due to the clean-up of cornstalks by farmers. In 1928 this area in Rhode Island showed an average of 876 larvæ per hundred plants, whereas in 1929, under clean-up methods, the number was reduced to 249. The adjacent area in Massachusetts in 1928 showed 654 larvæ per hundred plants, compared with 230 for 1929.

In the western area, in 1929, the season in general was unfavorable to the borer, there being only a slight increase in its abundance. In Michigan there was a decrease. Commercial damage in the western area occurred only in a few small fields along Lake Erie, chiefly in Lucas County, Ohio. Taking this area as a whole, the average number of borers per hundred stalks was 6.65 for 1928 and 7.78 for 1929; in other words, an average of 1 borer to 15 plants. To appreciate the significance of borer population based on the number of larvæ per hundred stalks, it should be noted that the beginning of commercial injury requires from 400 to 500 borers to 100 stalks, or an average of 4 or 5 borers per stalk. Except for the infestation in Massachusetts and Rhode Island, none of these figures indicate even an approach to crop losses. Taken as a whole, the record of the corn borer in the United States still leaves its future economic importance open to question. However, the heavy damage it occasioned over a few years in a limited district in Ontario now largely controlled by better farm methods and the fairly heavy initial damage in a limited district in Massachusetts are indications of the possible menace of this pest to our corn crop. This menace would seem to warrant the control methods which are now enforced to delay its spread, which must continue and which will eventually carry the insect into the main Corn Belt.

Natural Spread of the Borer

The natural spread of the corn borer by flight during the 1929 season was normal, namely, between 20 and 30 miles. Its long-distance carriage and establishment seem to have been substantially prevented by quarantines, notably road controls to prevent the carriage of green or sweet corn out of the infested area.

At 226 road and ferry stations 11,557,755 vehicles were inspected, and 342,772 ears of sweet corn and about 70,000 miscellaneous restricted articles were intercepted. From these some 2,430 borers were taken. All the confiscated material was destroyed or returned to its point of origin. In general, truckers, who normally transport the bulk of corn or similar products, are familiar with the quaran-

tine and cooperate in its enforcement. Between 90 and 95 per cent of the interceptions were made from passenger vehicles with motorists unfamiliar with the quarantine. Cooperation by such motorists has been good. Out of 11,000,000 motorists hailed, less than 1,000 refused to stop.

To detect any outlying points of spread, the States surrounding the corn-borer area are surveyed each fall, particularly along the main lines of motor travel. This survey in 1929 disclosed two fairly distant points of infestation, one in Kentucky on the Ohio River (Oldham County), the other in the southern point of Ohio (Gallia County), also on the Ohio River. Three outlying points were determined in northern New Jersey. These outlying points will be cleaned up in accordance with the previous practice, which in many cases has been successful. In the New England area, a considerable spread eastward along the coast in Maine was determined. There was a gradual approximation of the eastern and the western areas in Connecticut, Massachusetts, and Vermont.

PINK BOLLWORM OF COTTON

The big outbreak in 1927 of the pink bollworm of cotton in seven counties in west Texas, which was determined during the first three months of 1928, and which involved scattered infestation of nearly 400,000 acres of cotton land, seems to have been practically suppressed. Only a single infestation was found in connection with the 1928 crop, and that consisted of only a few bolls in a field near Odessa. This favorable result can be accredited to an intensive clean-up of the entire section, which was made possible by a special emergency allotment of \$400,000, and to the fact that conditions during the winter of 1927-28 were unfavorable to the survival of the hibernating larvæ. Similarly unfavorable weather conditions were indicated by the reduction almost to the zero point of the pink bollworm in portions of Arizona and New Mexico, and in the El Paso Valley of Texas. Provision was made by Congress in a joint resolution of May 21, 1928, for the establishment of a noncotton zone, particularly in the seven counties in west Texas referred to, but verbal changes in the appropriation item at the last moment made this money unavailable for use in these seven counties. Enforcement of a noncotton zone, in connection with the favorable winter and clean-up operations which were carried out, would probably have completed the eradication.

The only portion of west Texas which was covered by a noncotton zone was Brewster County. The cotton area of this county is on the Rio Grande in the extreme point of the Big Bend district, and the heaviest infestation occurring at any point in the United States has been in this county. The results of the clean-up and noncotton zone for a single year will be reflected on the crop of the present year, data concerning which are not yet available. The main idea in establishing a noncotton zone in Brewster County was to eliminate the possibility of spread by flight from that region to west Texas and New Mexico. The entire cotton area along the Rio Grande from the Big Bend to El Paso is in contact with Mexican cotton fields and therefore subject to reinfestation annually, a condition

which makes it impracticable to undertake any drastic eradication measures until Mexico can cooperate so that the cotton areas on both sides of the boundary can be cleaned up at the same time. All the areas in west Texas, New Mexico, and Arizona which are still invaded by this pest are under quarantine restrictions requiring the disinfection of the cottonseed at gins, fumigation and compression of lint and linters, supervision of oil mills, and the maintenance of road stations to prevent untreated material from being taken out of the infested areas. These precautions seem to have been effective in preventing spread of the insect to new locations.

GIPSY MOTH

Gipsy-moth infestation in New England, as measured by the acreage of woodlands defoliated, was much more severe in the summer of 1928 than it had been for many years, and the outlook is that the extent of the injury will continue to increase. More than 262,000 acres of forest land were stripped by the pest last year, and a greater acreage of defoliation was found in the summer of 1929.

The spread of this insect to the west is kept under control by the maintenance of a barrier zone about 25 miles wide extending along the eastern boundary of New York State from Canada to Long Island Sound and bounded on the west by the Hudson River. Intensive eradication measures are employed to stamp out all gipsy-moth outbreaks within that strip of territory. The number of infested locations in the barrier zone increased sharply in 1928, more than double that of the previous year. The worst part of the area was in southwestern Massachusetts and northwestern Connecticut and the adjoining portion of New York State, and was caused by spread from moth colonies east of the zone. All these new points in the zone were treated and sprayed; but since many were located in woodland, more intensive scouting of the large forest areas in the zone will be required. The department feels that the inspection of a belt of territory east of the zone and the treatment of all large infestations there is vitally necessary in order to prevent constant reinfestation of the territory that has been cleaned. To undertake such work will require a very substantial increase in this appropriation item.

More Satisfactory Conditions in New Jersey

In New Jersey, where an effort to eradicate completely an outbreak discovered in 1920 has been in progress, the situation is very much more satisfactory. No gipsy-moth infestations were discovered in the State during the last fiscal year except one small colony. The area infested when the pest was discovered in New Jersey nine years ago covered more than 200 square miles, and scouting revealed about 3,000,000 egg masses. The eradication plan adopted at that time by the Federal Government in cooperation with the State provided for the extermination of the pest by means of scouting the infested section and the territory surrounding it, the treatment of all egg clusters of the insect, and extensive spraying operations. This is the largest extermination campaign ever attempted against a forest insect of this type, and the excellent prog-

ress made is highly gratifying. The volume of work required has been gradually reduced, and the completion of the project in New Jersey is expected within the next few years.

Long-distance spread of the insect by the shipment of woody plants and forest and quarry products has been prevented by the enforcement of Federal quarantine regulations requiring the inspection of such products before their movement is allowed. During the past fiscal year 369,044 shipments forwarded to all parts of the United States and Canada were inspected, and 143,484 shipments that had been processed or stored in such a manner that infestation could not be transmitted were moved on permits provided for by the quarantine regulations. On the material offered for shipment, 1,782 clusters or larvæ of the gipsy moth were found. Before movement was allowed the infested material was cleaned.

The discovery and stamping out of many small colonies in this barrier zone, reinforced by the inspection of products to be shipped from the infested territory, have protected all sections of the United States from the permanent establishment of this pest, at expenditures which are small in comparison with the continuous losses that have been prevented.

JAPANESE BEETLE

Since the promulgation of the first Japanese-beetle quarantine in 1919, the area under regulation on account of this insect has increased from 48 square miles to 21,353 square miles, and now includes New Jersey, the District of Columbia, eastern Pennsylvania, northern Delaware, and small portions of Connecticut, New York, Maryland, and Virginia. The most isolated point of known infestation is 192 miles by air line from the center of the heavily infested area. Despite this apparently enormous increase in area, the annual spread by normal flight of the beetle of from 10 to 15 miles over a period of 11 years is largely responsible for the present distribution. The quarantine which is being enforced on account of the Japanese beetle has as its principal purpose the prevention of long-distance spread of this pest through the movement of nursery stock and farm and garden products. This purpose seems to have been fully achieved.

There is, however, in addition to local spread by flight, another type of movement which it is impracticable to attempt to control in view of the congested population in the area now reached by the beetle. This is accidental carriage by motor or train movement through the Japanese-beetle area during the period of beetle abundance. A number of isolated points of spread have been determined during the last two years which are believed to have resulted from such accidental carriage by motor or train. Most of these points, determined in 1927 and 1928, are within 50 or, at the outmost, 100 miles of general Japanese beetle infestation. With respect to such points, the department has approved the policy of treating them as separate control units rather than including them by a broad extension of the quarantine lines in the general quarantined area. This mode of treatment necessitates cooperation by the States concerned, and it is in accord with policies which hitherto have been followed in connection with other plant quarantines; namely, such quarantines as those on account of the gipsy moth, the corn borer,

and the pink bollworm. To include such isolated points under the general quarantine would immediately open extensive areas in the States concerned to the uncontrolled movement of nursery stock and farm products, with the result of establishing the beetle more or less quickly throughout such areas.

Results from Beetle Traps

The use of beetle traps at Baltimore, Washington, and in Alexandria County, Va., has resulted in the collection of great numbers of beetles. The possibility of substantial control at such isolated points by this method will thus be given a fair demonstration this year. That enormous quantities of beetles can be collected by the trapping method has been fully demonstrated. In fact, on a single property in New Jersey nearly a ton of beetles were thus collected during the current season. In the generally infested areas, however, such trapping is of little value, even in instances like the one cited, unless the employment of this method is general. Otherwise the placing of numbers of traps on individual properties will have the unfortunate effect of attracting enormous numbers of beetles to such properties from adjacent land. This objection, however, does not apply to isolated points.

The new outlying points at which the Japanese beetle has been found during the present summer include Boston, Mass., Providence, R. I., and Norfolk and Cape Charles, Va. It seems reasonable to infer that the beetle reached these places by the movement of boats from Philadelphia during the height of the season, aided possibly also by accidental railway carriage.

Within the present area regulated on account of the Japanese beetle there are over 4,000 nursery and greenhouse establishments. These comprise the principal and most extensive nursery operations in the country. More than 1,000 of these regularly ship quarantined nursery and ornamental stock from the restricted zone to all parts of the United States and various foreign countries. The enforcement of the quarantine regulations has accordingly grown to considerable magnitude, involving the yearly certification for interstate movement of 73,000,000 plants. To avoid risk of such plants being the means of long-distance carriage of the beetles in the larval stage, plants from nurseries determined as infested are either required to be shipped free from soil, or soil balls with the plants are given a chemical treatment which, without injuring the plants, will destroy the larvae. Under one or the other of these conditions all types of plants are permitted movement from infected nurseries or districts. In addition, the effective enforcement of the quarantine requires the supervision of shipment of thousands of carloads of sand, soil, peat, and manure.

Asiatic-Beetle Distribution

The present distribution of the Asiatic beetle covers a considerable area in northern New Jersey and the southern point of New York, with outlying points of infestation, respectively, at Albany, N. Y. (a determination of this year), New Haven, Conn., Harrisburg, Pa., and the District of Columbia. These beetles are somewhat closely re-

lated to the Japanese beetle and correspond also with the latter more or less in larval and adult habits. The economic importance of these beetles is largely, however, in their capacity to injure and destroy lawns and grasslands. This is particularly true of the so-called Asiatic beetle, but also applies to the Asiatic garden beetle, which latter, however, is, in the adult stage, an active leaf feeder and attacks a large range of ornamental and crop plants. The Asiatic beetle has demonstrated, at points where it has gained a foothold, a capacity to destroy lawns beyond that of the Japanese beetle or any of our native species. In New Haven, according to the State entomologist, upwards of \$100,000 has been spent in a few years for the replacement of lawns destroyed by the Asiatic beetle in an area of infestation comprising only a small section of that city. Both of these beetles have invaded important nursery districts; and quarantine restrictions are especially necessary, therefore, to prevent their distribution widely in the United States with plants shipped with untreated soil. This need is emphasized by the fact that large numbers of the white grub of this insect, in which stage it passes the fall, winter, and spring, have been found in earthballs about plants coming from infested premises.

The research work which has been conducted with respect to these beetles has developed means of disinfecting the soil which must go with certain types of nursery stock, and the movement of all nursery stock is provided for either under such treatment or when freed from soil. Local and other grasslands can also be protected from these beetles by arsenical poisoning, but this is a very expensive treatment which must be repeated at intervals.

RESEARCH IN ENTOMOLOGY

Research carried on by the Bureau of Entomology in connection with the newly imported pests of major importance discussed in the foregoing pages in regard to biological, environmental, and host relationships has gone hand in hand with the control and eradication efforts, and the results of this research form the substantial basis for such efforts. This research has covered every relationship of the insect to the plant and to farm practice, including the development of special types of farm or other machinery to make control inexpensive and possible by means in line with ordinary farm practice. It has covered also all the means of repression by use of poisons, gases, traps, etc., and has included the importation of natural enemies from the foreign countries of origin of these pests and the establishment of these natural-control aids here. This latter field is one of the greatest interest and importance because it eventually should bring about in this country the balance which exists in the countries of origin and which in most cases greatly limits the losses due to these pests or makes their recurrence infrequent. In the case of the corn borer, the Japanese beetle, and the gipsy moth particular effort in this direction has been made, and many thousands of parasites of different types have been introduced, and many of these have been successfully established. The beneficial results from such establishment are now beginning to show in the reduction of damage in the older and originally the most heavily infested centers.

UTILIZING FARM BY-PRODUCTS

Increased attention has been given by the department in the last year to the problem of utilizing agricultural by-products. In gross tonnage by-products constitute more than 60 per cent of the material annually produced from the soil. Though industrial uses have been found for some of this material, much further progress in this direction seems possible.

The principal farm by-products are cornstalks, corncobs, cereal straw, oat hulls, cotton stalks, cottonseed hulls, flax straw, peanut shells, and sugarcane bagasse. These materials are of course not wholly wasted at present. Their value as feed for livestock or as fertilizer is considerable. The industrial utilization of farm by-products is economically sound only when the prices paid for them to the farmer represent a greater value to him than the by-products would have if left on the farm. It has been demonstrated, for example, that on some soils under specially favorable conditions a ton of cornstalks, when plowed under, may have a fertilizer value of from \$5 to \$6.

In considering the commercial advantage of selling cornstalks the farmer must reckon the cost of buying, hauling, and applying the fertilizer which would be necessary to replace the stalks. He should also include a reasonable profit for the extra effort required. Chemical science and economic development may eventually make cornstalks and similar farm by-products worth more as cash crops than they are as feed or fertilizer. Meantime, the necessity of meeting this requirement should not be forgotten. The prospect that it may eventually be met with an ample margin, on a considerable part of our farm by-product output, is suggested by the progress already made.

Cull fruits and vegetables constitute a heavy annual waste. Sweetpotatoes alone, it is estimated, are culled to the extent of 20,000,000 bushels annually and potato culls amount to 76,000,000 bushels a year. Cull apples probably average 35,000,000 bushels annually, and similar large wastage of other fruits and vegetables takes place. Scientific and industrial progress which permits the utilization of these by-products constitutes at once a strong influence for agricultural improvement and an important means of conserving the Nation's resources. It is gratifying to be able to report, therefore, that experiments in the department have found economic uses for some crop materials formerly wasted and have laid a foundation for future economies of the same nature. A brief recital of what has been accomplished and some reference to the more promising of the investigations now under way should be of interest.

Farm Wastes Classified

Farm wastes may be classified under three main heads—namely, crop by-products, unsalable crop surpluses, and by-products of industrial operations upon agricultural raw materials. In the first group are included hulls, cobs, stalks, straws, etc. In the second are culled fruits and vegetables; and in the third, products that, while not without utility, may lack a profitable market. Chemical

research combined with a study of economic problems is the key to the utilization of these wastes. It is of course obvious that the problem of utilizing farm by-products is not merely a matter of discovering means of turning them into usable materials. It is also necessary to determine whether this can be done profitably, when full allowance is made for gathering, transportation, storage, and other costs. It is not sufficient, for example, to develop a process for making paper or fiber board from straw or cornstalks. Means must be found for doing so at a cost that will enable the product to compete with paper or fiber board manufactured from other materials. Thus the problem is twofold—(1) chemical, and (2) economic. The economic phase of the problem may require much practical experimentation, perhaps during many years, and may possibly also involve large-scale production. Industrial operations that are uneconomic on a small scale may be profitable on a large one.

Important results have been obtained from studies of the utilization of the cellular materials of crop by-products. These materials consist chiefly of cellulose, lignin, and carbohydrates. Dry cornstalks, for example, consist of approximately 36 per cent cellulose, 30 per cent lignin, and 27 per cent carbohydrates. Cellulose is the fibrous part of the plants and represents about one-third of the dry matter of vegetation.

As far back as 1908 mill-scale experiments were conducted by the department in making paper from the cellulose of farm by-products, especially cornstalks, broomcorn, sugarcane bagasse, rye straw, cotton-hull fiber, cotton stalks, flax straw, hemp hurds, etc. These investigations showed that excellent white paper can be made from bagasse, straw, and cornstalks. One commercial mill is now making insulation board from wheat straw, and two others are developing processes for manufacturing board from cornstalks. Another mill is producing bleached pulp from cornstalks. These industrial enterprises resulted largely from early scientific investigations conducted in the department and by other interests, and may eventually open up important new markets for the cellulose contained in crop by-products.

Experiments on Commercial Scale

The practicability of using by-products from farm crops for paper making on a commercial scale has not yet been fully demonstrated, though encouraging experiments are under way. Fiber board is produced profitably from sugarcane bagasse. Under certain conditions unbleached wrapping paper and board may be produced profitably from straw. Approximately 500,000 tons of straw were used for this purpose in 1927. Insulation board is now made commercially from straw and cornstalks, as well as from bagasse. Cellulose from wood is now the chief raw material for paper, fiber board, insulation board, etc., but our wood supply is decreasing at a rate which indicates that other raw materials for paper and board making will eventually be in demand.

Important results have been obtained by the department in the distillation of straw and similar by-products. In tests made at a

full-size gas-producing unit on the department's farm at Arlington, Va., it was demonstrated that gas produced from straw may be used for lighting and heating and as a motor fuel. As yet this can not be done profitably on the individual farm. Commercial experiments, however, have indicated that this work may eventually have significant industrial consequences. An inviting field is the production of alcohol and acids from cellulose wastes. Investigations in this country and Europe have shown that alcohol, acetic acid, and acetone may be produced from straw and similar materials.

Research on lignin in the department has yielded results of exceptional significance. Lignin constitutes from 20 to 30 per cent of the dry material found in hulls, straw, and leaves. It is a complex material with many industrial potentialities, possibly equaling those brought to light a century ago by experiments with coal tar. The Department of Agriculture has utilized lignin in making varnishes, dyestuffs, and various aromatic chemicals. It has produced synthetic resins by combining lignin with aromatic amines and has obtained acetone, methanol, acetic acid, guaiacol, and eugenol from lignin. Research work on furfural in the department has led to the commercial production of this chemical compound at prices only a fraction of those prevailing before the work was started.

Furfural is a liquid obtained by the action of steam and acid on pentosans, an important carbohydrate constituent of some crop by-products. It is commercially used as a substitute for formaldehyde in the preparation of artificial resins of the Bakelite type, and also as a solvent, a purifier of rosin and anthracene, a paint and varnish remover, an intermediate in the production of dyes, a repellent for the blowfly, and a possible intermediate chemical in the production of pyromucic acid. It is being made commercially from oat hulls and is reported to be selling in tank-car lots at from 10 to 12 cents a pound. This price may be compared with \$30 a pound in 1918, when the department's furfural research work began. In producing furfural from oat hulls, corncobs, and other farm wastes certain by-products are elaborated which can be used in making corrugated-fiber containers and in the production of coal briquettes. As yet utilization of these by-products is in only the development stage.

New Uses for Sweetpotatoes

Investigations are under way in the department in the technology of converting sweetpotatoes into commercial products. In some seasons a large part of the sweetpotato crop is classed as cull and finds no profitable market. Approximately 20 per cent of the crop may be too large or too small, or unmarketable for some other reason. In addition, surplus sweetpotatoes are often a problem. When growing conditions are exceptionally favorable the yield from a normal acreage may exceed the demand. Semicommercial experiments are now being conducted in the manufacture of starch from sweetpotatoes at the department's Arlington Experiment Farm. Excellent starch has been made in this way and commercial methods of manufacture are being developed. A commercial sweetpotato starch plant has been erected in Louisiana. Sweetpotato starch may possibly prove an acceptable substitute for tapioca and sago starch,

the raw product from which high-grade dextrin and adhesives for postage stamps and envelopes are made. This country imported about 116,000,000 pounds of tapioca and sago products in 1927. If starch from sweetpotatoes can be substituted for starch from imported tapioca and sago, the demand for sweetpotatoes should be increased by some 18,000,000 bushels. Dried sweetpotato flour is also valuable in bread making. Heretofore unmarketable sweetpotatoes have been largely fed to hogs. Compared with other root crops, they are rich in the proteins essential for growth and nutrition, and are valuable as a supplementary feed.

Overproduction of potatoes is frequent enough to indicate the urgent necessity of industrial utilization of the surplus. Overproduction, however, tends to alternate with underproduction, so that industrial concerns utilizing potatoes might not be sure of a continuous supply. In Germany manufacture of starch from potatoes is an established industry. In fact, practically all the commercial starch produced in Germany, Poland, Holland, and some other European countries comes from potatoes. Methods of similarly utilizing surplus potatoes in the United States are under consideration in the department. Research on the industrial utilization of potatoes is going forward along many lines, including the manufacture of potato starch, potato dextrin, potato flour, dried stock feed, and potatoes as a source of industrial alcohol for motor fuel. The possibility of utilizing the same plants for the manufacture of both sweetpotato and potato starch is being studied. This can be done in localities where both crops are grown. Attempts to utilize potatoes and sweetpotatoes are not being restricted to starch production alone, but include the production of modified starches, dextrins, etc.

Industrial Uses for Corn

Numerous industrial uses for corn have been developed in line with research work originally launched in the Department of Agriculture. Formerly cornstarch for cooking and laundering was about the only industrial product made from corn. Private scientific investigations then showed how a sirup and a sugar could be made from cornstarch and the by-products of starch manufacture converted into valuable products. To-day, from the waste of the corn kernel after the starch is removed, the industrial chemist produces corn gluten, a highly valuable feed; from the germ of the corn he obtains corn oil, an edible oil now largely used in salads and for cooking. Large quantities of corn are now annually consumed in the corn-products industry. Progress has also been made in finding additional uses for other cereals, as well as for fruits and vegetables that might otherwise go to waste.

Processes developed by the department for the dehydration of fruits and vegetables have been helpful to the dehydration industry. In Idaho and Washington commercial dehydration plants use these processes, or developments thereof, for the drying of prunes and of surplus apples. Some success has attended commercial developments in New Orleans, Chicago, and Niagara Falls in the dehydration of vegetables. Sweet corn is dried commercially in Pennsyl-

vania and Ohio. Dehydration as a method of food preservation has great possibilities, but research is necessary to develop means of retaining the color, the flavor, and the vitamin content of fruits and vegetables, and also to devise effective methods of packaging, etc. The department has temporarily dropped its researches on dehydration problems, since Congress has not continued the appropriation for the work.

Utilization of farm by-products for the production of alcohol for motor fuel and for other industrial purposes has important possibilities. Surplus corn, surplus potatoes, and materials rich in starch generally are potential sources of alcohol, and methods of obtaining it have been investigated in the department. The practicability of using alcohol as a motor fuel has been demonstrated. Chemical and automotive engineers have solved the technical problems involved, and the commercial utilization of alcohol for fuel is now wholly an economic problem. Should scarcity raise the price of gasoline to a parity with the cost of producing alcohol, the latter product will probably become a motor-fuel competitor of gasoline. At present by-product molasses is largely used in the manufacture of industrial alcohol, but there are many other possible sources, especially cull and surplus fruits and cannery wastes.

Gossypol Poisoning Danger Nonexistent

Recent work in the department, which elaborates and verifies previous studies made by State experiment stations, should increase the commercial utilization of cottonseed meal. It has been shown that the supposed danger of gossypol poisoning from the use of cottonseed cake meal as feed for livestock does not exist. When properly treated and refined, cottonseed meal is a useful feed, though its protein alone is not adequate for optimum growth and nutrition. This shortcoming, however, may be corrected by the addition of other feeds. In the past, because of its presumed toxicity much cottonseed meal has been used as fertilizer. With a better understanding of the proper use of this product in feeding livestock the demand for it should greatly increase. Cottonseed, formerly almost wholly wasted, now is worked up into products having a yearly value estimated at more than \$250,000,000. Rayon is manufactured from linters, the fuzz on the seed.

Experiments conducted in the department indicate possibilities in the utilization of peanut shells in floor-sweeping compounds, in dynamite, and in linoleum. Peanut shells are a possible source of alpha cellulose, the basic substance in the production of rayon. Chemists in the department have produced a beautiful alpha cellulose from peanut shells, though the product lacks certain physical properties necessary in the profitable production of artificial silk. Further research may correct this defect. Paper board comparing favorably with commercial wall board has been made experimentally from peanut shells. Peanut meal has been demonstrated to be valuable as a feed supplement, and peanut flour combined with wheat flour makes a nutritious and palatable bread.

Grease and Potash from Raw Wool

In cooperation with wool growers the department has developed improved methods of recovering and utilizing the grease and potash contained in raw wool. Heretofore a large part of the by-products of wool scouring has been disposed of as sewage at a total loss. The possibility of eliminating this loss is now indicated. Other studies have shown that crude wool grease when properly refined is useful for currying leathers and waterproofing canvas. Further study may develop new uses for it.

Many by-products of the farm and of the forest are actual and potential sources of tannin, an essential material in the manufacture of leather goods. Studies in the department have laid the foundation for the development of new supplies of tannin through the utilization of miscellaneous plant products and wastes. This work holds great possibilities in view of the fact that the present source of more than one-half our domestic supply of tannin is the American chestnut tree, which seems doomed to extermination by the chestnut blight.

FARM FIRES

The farmer loses a material part of his annual income by fire. It has been estimated that fires on farms annually take a toll of about \$100,000,000 worth of property. At the request of the National Fire Protection Association, the farm insurance organizations, and other interested agencies, the department has undertaken a study of the causes of farm fires and of means of preventing them.

Special attention is being given at this time to spontaneous heating of farm products, which causes annual losses amounting to millions of dollars. These losses take two forms—namely, actual fire and spoilage of stored products by overheating. In 1927, according to the National Board of Farm Underwriters, farm-fire losses from unknown causes on property insured by its member companies amounted to \$12,151,314, and it seems probable that a substantial part of these occurred from spontaneous ignition. Corresponding figures are not available for the far larger part of the farm property which is insured in farmers' mutual fire insurance companies or for that part which remains uninsured. Other causes of farm fires are lightning, defective chimneys and flues, sparks on combustible roofs, matches and smoking, careless use and storage of gasoline and kerosene, and faulty electrical wiring.

Improperly cured or damp hay (especially the legumes), when stored in large masses, or hay which has become wet subsequent to storage, is particularly subject to spontaneous or self-generated heating. Under certain conditions, as yet undetermined, this heating will progress until spontaneous ignition occurs. The Bureau of Chemistry and Soils of this department is studying the chemical, bacteriological, and engineering aspects of this problem. Laboratory research and also large-scale field experiments are being conducted on the department's farm at Beltsville, Md. Hay in storage is being studied under conditions believed to be ideal for spontaneous heating, and also duplicating as nearly as possible the conditions on

farms. The results obtained should yield fundamental data, together with information on practical measures to reduce farm-fire losses.

FERTILIZER PRACTICE

The commercial-fertilizer industry has been going through a gradual but distinct evolution during the past 10 or 15 years. There has been a constantly increasing use of inorganic fertilizer materials, a tendency toward the elimination of low-grade fertilizers, and increased use of synthetic fertilizer salts. These changes are fundamental. Greater use of inorganic materials means that the fertilizer industry is becoming a chemical industry. Formerly it utilized to a large extent the by-product materials of the packing house and mill. Remarkable progress has been made recently in the development of synthetic fertilizer materials, notably in the fixation of atmospheric nitrogen.

These new nitrogen materials are characterized by high plant-food concentration. New compounds of phosphoric acid have been developed which contain high percentages of this food constituent. Potash salts of high potash content are available, and there has been rapid development of concentrated fertilizers containing 30 or more per cent of available plant food. The department, in cooperation with a number of the State agricultural experiment stations, is conducting a wide range of experimental work to compare concentrated fertilizers with ordinary-strength fertilizers on prominent soil types. If the farmer can satisfactorily utilize this concentrated material, considerable savings in freight, handling, hauling, and other items will result.

In sections where the soil has good water-holding capacity and rainfall is adequate concentrated fertilizers show up well in comparison with those of ordinary strength. On light sandy soils in the coastal plain section, where rainfall may be scanty at and following planting, more experimental work is required as to the placement and distribution of concentrated fertilizers and as to the degree of thoroughness with which they should be incorporated with the soil. It will not be practicable to make definite recommendations until this work has been done.

It is necessary also to develop fertilizer-distributing machines with suitable attachments to insure the proper application and incorporation of the fertilizer with the soil. In some sections, where large quantities of fertilizer are applied to the acre, the use of concentrated fertilizer has passed the experimental state, and farmers are discovering its advantages. On crops which ordinarily receive only a few hundred pounds of fertilizer to the acre, ordinary-strength fertilizer will probably continue to be used, as it is more easily applied uniformly.

Chief Plant-Food Elements

The chief plant-food elements around which experimental field and greenhouse work has heretofore been largely centered are nitrogen, phosphorus, potassium, calcium, magnesium, sulphur, carbon, hydrogen, oxygen, and iron. In fact, the fertilizer industry has

been developed on the principle that nitrogen, phosphorus, and potassium are the key plant-food elements. As a result, the industry has largely confined itself to the production of fertilizers containing mixtures of nitrogen, phosphoric acid, and potash carriers. Inquiries have recently arisen concerning some of the less common soil elements. These include manganese, magnesium, boron, iodine, fluorine, copper, iron, chromium, vanadium, titanium, etc. Studies are under way to determine whether deficiencies of one or several of these rarer elements may interfere with plant growth and development. The subject is of considerable importance. Preliminary experiments indicate that a small application of certain of the so-called minor elements of plant food is an advantage. The effect of manganese on a highly calcareous soil in Florida, where tomatoes are commercially grown, is a striking example. On this soil the difference between success and failure may be determined by the use of manganese compounds. As light an application as 50 pounds of manganese sulphate to the acre prevented chlorosis, stimulated vegetative growth, and insured commercial growers a successful crop.

Deficiencies of the less common soil elements may also prove detrimental on light sandy soils, such as are found in the Atlantic and Gulf coastal plains regions. This is particularly true of soils that are subject to constant leaching. There is some evidence that the continued use of relatively pure synthetic salts in fertilizers on certain soils may prove detrimental, owing to the absence of impurities which, in ordinary fertilizers, supply some of the less common elements. The questions involved deserve thorough investigation under field conditions.

FOOD AND DRUGS ACT

The enforcement of six laws designed to keep our markets free from adulterated and misbranded foods, drugs, insecticides, and naval stores has done much to advance the interests of farmers and ranchers. These laws—the food and drugs act, the tea act, the insecticide act, the naval stores act, the import milk act, and the caustic poison act—are enforced by the Food, Drug, and Insecticide Administration, a regulatory unit of the department established for that purpose on July 1, 1927, by act of Congress.

The economic advantage to country and town buyers alike of being protected against traffic in foods and medicines that are not what their labels represent them to be has been pointed out in previous reports. The application of the food and drugs act to the sale of stock foods also guards the farmer against having to pay high-protein feed prices for feed of low-protein content, and the application of the insecticide act insures truthful statements on labels for the insecticides and fungicides used throughout the country in the producers' war against insect pests and fungous diseases.

Perhaps the most outstanding accomplishments of the year under these acts, so far as the farmers' and ranchers' interests are concerned, however, have been the changes effected in the claims under which veterinary preparations and insecticides for use on livestock and poultry are offered for sale. Many of these preparations, of course, have always been put out by honest and painstaking manu-

facturers, who saw to it that no promises that could not be fulfilled appeared on the labels or in the circulars accompanying the packages of their products. But unfortunately many others were sold under claims for cures that could not possibly be accomplished by any of the ingredients used. The best example of what has been done against such preparations is the action taken some time ago against an alleged cure for contagious abortion, found on analysis to consist of nothing more than brown sugar and wheat bran. Nine and one-half pounds of this "cure," which cost less than 40 cents to produce, was sold for \$5. Seizure, under the food and drugs act, of shipments of this product throughout the country resulted in its removal from the channels of trade. The manufacturers claimed that their sales amounted to about \$15,000 each month before the Government took a hand in the matter. Putting an end to this fraud alone saved dairymen at least \$180,000 a year.

Present-day reliable veterinary medical opinion holds that no known drug or mixture of drugs can be considered efficacious in the treatment of such diseases as contagious abortion of cattle, hog cholera, hog flu, fowl cholera, diarrhea of chicks, coccidiosis, roup, gapes, chicken pox, blackhead of turkeys, distemper of dogs, black tongue and running fits of dogs, influenza, distemper, and heaves of horses. In spite of this well-established fact, preparations prescribed for use in such affections are constantly being put out. As a result of an intensive campaign under the food and drugs act, the greater part of these alleged remedies, which a few years ago flooded the market, have either been entirely withdrawn or have had their labels and circulars so changed as to prevent their being bought under misapprehension of what they can really do.

Action in Regard to "Worm Expellers"

The great array of "worm expellers," "mineral mixtures," "stock powders," "conditioners," and "tonics," offered to the agricultural public under false and fraudulent claims, have recently come under the ban of the law. For instance, drastic action was taken against a preparation labeled "Worm Eradicator," when chemical analysis showed that it contained approximately 95 per cent of water and 5 per cent of material utterly worthless against worms of any type in poultry or any other animal.

The sale of preparations to be administered internally to poultry afflicted with lice and mites constitutes another fraud against which the department has proceeded, in this case under the insecticide act. Court action was taken, and a verdict for the Government rendered, against a preparation for which the manufacturers claimed that one-half teaspoonful in each gallon of drinking water provided for poultry would rid the fowls of all lice and mites. Chemical analysis showed that this product consisted of about 8 per cent of lime and sulphur and 92 per cent of water. Entomological examinations showed that it would kill neither lice nor mites.

American farmers and ranchers annually spend millions of dollars on veterinary preparations of one kind or another. Unless such preparations will do what their manufacturers say they will, this expenditure is a great financial loss. Even more serious than the loss of good money, however, is the false sense of security thus

attained, leading, as it often does, to the spread of a disease throughout an entire community before proper scientific methods of control are begun. The need for legal action to prevent fraud of this sort will doubtless continue indefinitely; rapid strides, however, in ridding our markets of falsely labeled veterinary preparations have recently been made through cooperation with the industry. Manufacturers are showing an increasing desire to comply with the spirit as well as the letter of the law by voluntarily removing misbranded preparations from the channels of trade and revising their labels and circulars to eliminate all claims that are not fully warranted by the composition of their products.

PLANT-INDUSTRY DEVELOPMENTS

Postwar agricultural developments emphasize the necessity of systematic effort to regulate farm production in accordance with market needs. This calls for a determination in advance of the acreage required. Any such determination can of course be only approximate, since production depends not on acreage adjustments alone but also on the weather and on other unpredictable influences. Yet acreage adjustments are extremely important. The annual variation in the outturn of some leading crops is mainly dependent on annual variations in acreage. It is imperative, however, if acreage adjustments are to serve their purpose adequately, that the crops grown shall be well adapted to their climatic and soil conditions, and also reasonably immune or resistant to pests and diseases. Production can be better influenced through acreage changes when the varieties planted may, under normal conditions, be relied on for reasonably stable performance.

Overproduction, with resulting low prices, may follow underproduction due to regional crop disasters. Such disasters, though frequently the result of climatic conditions, are by no means always thus caused. They may be due largely to the ravages of insect pests or plant diseases. Research and experiment in the Bureau of Plant Industry of the department have developed many important plant varieties with disease and pest-resistant qualities. Such dependable varieties may play an important rôle in efforts to stabilize production. In fact, the reduction of seasonal hazards in this way has already contributed much to the better adjustment of supply to demand relationships. A glance at what has been accomplished will illustrate the principle involved.

Hazards in wheat production under dry-land conditions, for example, have been much reduced by the introduction of hard red winter wheats from Russia and by the development therefrom of improved pure lines or hybrids such as Kanred, Oro, Regal, and Newturk. Drought-resistant and rust-resistant varieties of durum wheat are a factor in stabilizing production in the northern part of the Great Plains. In the Pacific Northwest average acre yields of wheat have been increased about 3 bushels without appreciable additional cost, by the application of the department's discovery that early plowing of stubble for summer fallow is valuable. Rust losses in the North Central States have been much reduced by the eradication of more than 17,000,000 barberry bushes. In the eight years from 1921 to 1928, inclusive, average annual losses from rust in this

region were only about one-third of what they were during the 6-year period 1915-1920. In the dairy belt oats production per acre has been increased by the development of pure-line varieties. Cereal smuts have been much reduced through the development of fungicides.

Control of Seed and Soil Borne Organisms

In the Corn Belt success has been achieved in the control of numerous seed and soil borne organisms that cause rots in the stalks, roots, and ears of corn plants. Soil treatments have been developed for lessening the harmful influence on the corn plant of iron and aluminum in the soil. Field practices have been developed that prevent severe injury to young flax from heat canker. States where flax culture had been abandoned have resumed the production of that crop as a result of the development by the bureau of wilt-resistant varieties. Research on the wheat nematode resulted in the control of this pest, and research on flag smut of wheat ended in the practical extermination of the disease.

Cane-sugar production in Louisiana, which was threatened with extinction by mosaic disease, has been rehabilitated by work done in the department. Unofficial estimates of Louisiana's 1929 sugarcane area place it at 225,000 acres. This compares favorably with the acreages grown before the appearance of mosaic disease. This disease was discovered in 1919 in a small area in the eastern part of the State. For three years its harmful effect was little noticed. Thereafter, however, the disease spread rapidly through Louisiana and other sugarcane-growing States. In 1926 the yield from 128,000 acres in Louisiana was only 47,000 tons of sugar. It was evident that the varieties of cane then grown could no longer be relied upon for the production of sugar and sirup. Great areas of cane lands passed out of cultivation. Sugar mills remained idle, and the sugarcane industry faced collapse.

Mosaic-Resistant Cane

Following a survey, the Department of Agriculture imported varieties of sugarcane known to be tolerant of the mosaic disease. These varieties, propagated from cuttings, occupied one-fourth of the sugarcane acreage in Louisiana in 1927. In that year 71,000 short tons of sugar was produced from 73,000 acres. In 1928, 175,000 acres were planted to sugarcane in Louisiana, approximately 135,000 acres being planted to the new varieties. It is estimated that cane from 200,000 out of the 225,000 acres planted this year will be available for the production of sugar. Disease-tolerant varieties of cane have also been established in the sirup-producing areas, where they are rapidly replacing the old varieties. Thus, in a few years a threatened industry has been reestablished upon a sound agricultural and economic basis through scientific knowledge. Further improvement of sugarcane varieties is expected from experiments with new types of breeding stock obtained in an expedition to New Guinea. In this expedition the department's plant explorers visited hitherto inaccessible regions by airplane.

Soybean production has increased tremendously in the United States during the last decade, and about half of the gain is traceable to the introduction of improved varieties by the Department of Agriculture. These varieties are adapted to a range of conditions quite beyond the possibilities of the varieties previously grown. They have made the production of soybeans more certain and more profitable and soybeans have been usefully substituted for other staple crops with which they do not compete directly from the standpoint of consumption. With the corn-borer menace in corn production, soybeans may become a still more important stabilizing factor in the agriculture of the Corn Belt. Sudan grass, introduced from Africa in 1909, is now grown to an amount exceeding \$15,000,000 in value annually. Alfalfa production has been much increased through the development of hardy strains. The area in alfalfa in 1928 in the States from Wyoming and Montana to the Atlantic coast exceeded 5,651,000 acres, as compared with only 3,179,000 in 1919.

Sorghums introduced by the department have done much to stabilize agriculture in the semiarid regions. In 1928 more than 10,000,000 acres¹ of sorghums were grown in the United States, chiefly in the southern Great Plains. This crop provides the wheat farmer of the semiarid regions with dependable feed, both grain and forage. In the Southern States the department encourages the improvement of pastures by disseminating information about Bermuda grass, carpet grass, Dallis grass, and Lespedeza. It has introduced Bahia grass, centipede grass, and Korean Lespedeza into this region. These grasses, when properly cared for, provide pastures in the Southern States equal in carrying capacity to the best bluegrass pastures of the Northern States. This is a contribution of great value to the livestock industry of the South, which requires improved pastures as a basis for needed expansion.

Asparagus Growing Protected

Disease-resistant strains or types of asparagus developed in the department have saved a menaced industry. Asparagus rust and the losses resulting therefrom have thus been much reduced. The strains developed in the department, besides being resistant to rust, are superior in vigor, size, and tenderness to the stocks formerly planted. Much of the risk in tomato production has been eliminated by the development of improved varieties in the department. A number of varieties highly resistant to certain diseases and superior in table quality are now commonly grown. Stem-end rot of watermelons, formerly a serious factor in transportation to market, can now be reduced to a negligible degree by simply disinfecting the cut end with Bordeaux paste. Average yields of potatoes have steadily increased in recent years as a result of the increased use of disease-free seed and high-yielding strains. In 1928 the average acre yield of potatoes in the United States was 121 bushels, as compared with 98 or 99 bushels prior to about 1920. Through better seed and better pest control, growers have acquired increased power to regulate their output.

¹ This figure includes estimates for a number of States for which detailed figures are not available.

In accordance with experimental results showing the importance of prompt cooling of fruit for satisfactory shipment, a portable car-precooling apparatus has been invented and made available for use throughout the fruit districts of the United States by securing a public-service patent. The device was designed primarily for highly perishable fruits, such as strawberries and peaches, and has been used with much success in conditioning car lots of strawberries and peaches in the South. The principle on which this apparatus works is to reverse the natural air circulation of the refrigerator car, utilizing small motor-driven blowers to pull the air into the ice bunkers through the bottom bunker opening up through the ice and out into the body of the car on top of the load. With this apparatus cars may be loaded according to standard practice and precooling accomplished without disturbing the load during or after cooling operations. When it is considered that the more rapidly a highly perishable commodity can be cooled after harvesting, the greater the possibility of the storage period being extended, it is reasonable to assume that the precooled commodity can be transported and remain in good condition a greater distance than a nonprecooled commodity.

Losses Reduced in Handling Oranges

Losses from decay of oranges in transit have been much reduced through the department's discovery that blue mold can be prevented by handling the fruit so that the skin will not be injured. Much advantage has resulted from the standardization and improvement of varieties. The Valencia variety of California is now produced in a quantity nearly equal to that of the Washington Navel. As the navel orange is shipped during the winter months and the Valencia in the spring, the two varieties furnish a comparatively uniform and constant supply from California throughout a large part of the year, to the advantage of growers, shippers, and consumers. In Florida, growers have almost unanimously adopted a list of four or five oranges that ripen in sequence during the Florida orange season. Production of Satsuma oranges has been made more profitable by a treatment whereby fruit that is green, though fully ripe, can be turned yellow. Much of the Satsuma orange crop attains prime eating maturity while the skin is still leaf green. In this condition it is unmarketable because of its color. Subjecting the fruit to a certain gas destroys the green pigment, and the desired yellow or orange color becomes dominant. In this way the fruit can be marketed when in its best condition for eating and when there is relatively little competition from other varieties.

During the past year a first-hand study of the date varieties of the Mesopotamian region has been made by specialists of the Bureau of Plant Industry, with special reference to locating, if possible, varieties suited to some of our southwestern valleys where the occasional occurrence of untimely rains during the ripening season renders the north African varieties unsuited to commercial culture. Offshoots of a number of interesting and promising varieties were secured, which will be tested under conditions existing in this country, particularly in the lower Rio Grande Valley in Texas, where there is much interest in the possibility of establishing the commercial production of this crop.

Boron Injury to Plants

In view of the recent discovery that certain plants, such as oranges, lemons, and walnuts, are especially sensitive to small quantities of salts of boron in the soil moisture, material progress has been made in the investigation of this problem. It has been found that with the more sensitive plants boron injury may occur from the use of irrigation water containing boron in excess of 5 parts in 10,000,000. From the surveys conducted during the past year it has been found that certain irrigation waters in California and Nevada carry injurious quantities of boron, but it has also been found that in general the boron occurring in surface water supplies may be traced to one or more comparatively limited sources, so that by diverting these wells or streams from the main water supplies it appears possible to reduce the boron concentration below dangerous limits. Since some crop plants are much more tolerant of borax than others, it appears probable that the waters with relatively high boron content may be utilized for irrigation of those crops that are usually benefited or at least not injured by boron content above the safe limit for citrus fruits or for walnuts. The California Agricultural Experiment Station is cooperating with the Bureau of Plant Industry in these investigations.

Scab Disease of Wheat and Barley

The scab disease of wheat and barley, which occurs more or less commonly each year in the more humid areas of America and Europe, caused heavy losses of spring wheat and barley in some of the Corn Belt States in 1928, particularly in parts of Ohio, Illinois, Indiana, and Iowa. When fed to hogs, scabbed barley produces digestive troubles. The fact attracted wider attention than usual, owing to the exceptional extent of the scab outbreak. Extensive feeding experiments were conducted in the department with scabbed barley. Barley containing more than 10 per cent of scabbed kernels is unpalatable to hogs, and many hogs will not eat it. It was found, however, that such grain may be fed to cattle and sheep with safety. Chemical studies of a preliminary nature indicated that in scabbed barley three general types of change took place: (1) starch and dextrin hydrolysis to dextrins and glucose, respectively; (2) fat hydrolysis with marked increase in fatty acids; and (3) protein hydrolysis with increase in basic and water-soluble nitrogen. It has not yet been definitely determined which class of substances causes the trouble with swine, but the water-soluble nitrogen fractions are believed to be the cause. The area affected by the scab disease in 1928 usually produces only a small part of the barley and spring wheat grown in this country. It produced more than usual last year because barley and spring wheat were largely used to replace winter wheat that had been winterkilled.

Cause of Scab

Scab is caused by a parasitic fungus (*Gibberella saubinetii*). It attacks rye, barley, oats, corn, and some wild grasses as well as wheat. One stage of the fungus occurs on old cornstalks, from

which it may be transmitted to wheat or other small grains, when those crops are sown following corn, if the old cornstalks have not been plowed under. Removal or burial of old cornstalks reduces the infection to such an extent that the scab does not cause serious losses to the crops that follow the corn. Scab-resistant varieties are being developed by the department in cooperation with State experiment stations. Such varieties of barley as Norka, Progress, Resaca, Illinois No. 1, Oderbrucker, and Manchuria are fairly resistant. Treating well-cleaned seed with one of the standard mercury-dust disinfectants is a helpful control measure.

Control of Bacterial Spot

Gratifying progress has been made in the practical control of bacterial spot, a disease which attacks the twigs, leaves, and fruit of the peach, causing heavy losses in Illinois, Indiana, North Carolina, South Carolina, Arkansas, Tennessee, Kentucky, and the Maryland-Delaware-Virginia Peninsula. Trees in a high state of vigor tend to be resistant, and therefore fertilization, pruning, etc., are of great value in preventing losses from the disease. Work upon the problem of developing a spray which could be applied repeatedly to the peach without injury, which would be cheap, and yet control the disease, was begun in 1925. Of about 200 different sprays tested during this period, one composed of 4 pounds of zinc sulphate combined with 4 pounds of hydrated lime, in 50 gallons of water, has given definitely favorable results. Supplementary to proper fertilization, pruning, and other good orchard practices, six applications of the zinc-lime spray at intervals of two weeks beginning at petal fall have, in experimental tests, given satisfactory control. In these tests it has greatly checked the disease on leaves and fruits, has not injured any part of the trees even when used at double strength, has stimulated leaf development, and can safely be used with the insecticide, arsenate of lead. The ingredients are cheap and easily obtained.

Phony Disease of Peach Trees

After several years of intensive investigation of the mysterious phony disease of peach in Georgia with negative results, late in 1928 the communicability of the disease from the roots was established. After all the usual known methods of artificial transmission of virus diseases affecting trees had been tested and had failed, the grafting of diseased roots on healthy peach roots gave positive results. The communicability of the disease being thus established, a quarantine to prevent its spread on the roots of nursery stock from the infected region to other sections was established, and an extensive cooperative program of control of the disease by promptly eradicating all trees found infected has been started. Much research work upon the disease still remains to be done to determine the natural infection method, and in the direction of finding or developing disease-resistant stocks suitable for the peach. However, the progress already made is sufficient to encourage the expectation that this disease, which recently assumed such proportions as to threaten the

extensive peach industry of our South Atlantic States, will eventually be brought under control.

LIVESTOCK-DISEASE CONTROL

Livestock production is gradually being protected from the hazards and losses caused by disease, and made more profitable through knowledge gained by experimental work on breeding, feeding, and management. The suppression of animal diseases and parasites is accompanied by the strengthening of barriers to exclude plagues and pests that cause heavy losses in other countries. Our extensive foreign commerce involves constant danger of the occasional appearance of foreign diseases, especially at or near seacoast ports. But the department takes every reasonable precaution and is prepared to deal promptly with any outbreaks that may occur.

An outbreak of foot-and-mouth disease in January, 1929, was quickly eradicated. The country had been free from this malady for several years. It principally affects cattle, sheep, swine, and goats, and its great danger lies in the degree to which it reduces meat and milk production, and in the extreme rapidity with which it spreads. The infection entered through garbage from a merchant vessel that had taken on a quantity of fresh meat in South America. The ship docked at San Pedro, Calif., the harbor of Los Angeles. Hogs on a Los Angeles County ranch developed the disease after being fed garbage from the vessel. Several hundred swine on the same ranch became infected within a few days.

Prompt and vigorous action was necessary. Accordingly, the United States Department of Agriculture, cooperating with State and county officials, established a protective quarantine about the hog ranch, and slaughtered and buried the entire herd, numbering 3,271 animals. Some cattle on near-by premises were slaughtered and buried also. Inspectors then undertook to trace any infection that might have spread while the disease was in the incubative stage. In a few weeks the disease developed on four other premises within a few miles of one another. All the animals on these premises were promptly slaughtered and buried even when only a few showed symptoms of the disease. By this drastic action the outbreak was restricted to the five premises mentioned. As on previous similar occasions, owners of the condemned livestock were reimbursed, at a fair appraisal, for livestock and property destroyed.

This visitation of foot-and-mouth disease caused less loss to the livestock industry and less interruption to business than any previous outbreak. It lasted only two months, setting a record in quick eradication. A noteworthy detail of the eradication proceedings was the prompt inclosure of infected or seriously exposed premises with a high fence of chicken-wire netting. This barrier restrained dogs, poultry, and other small animals, as well as unauthorized persons, from entering. It aided the guards at gateways in maintaining a rigid quarantine. The success of the eradication shows the importance of maintaining a well-trained force of veterinarians for such emergencies. Occasional outbreaks need not cause undue alarm, but should be the signal for energetic, cooperative action. Regulations for excluding foreign maladies are our first line of defense, but can not be relied on exclusively.

The infectious poultry malady, European fowl pest, which appeared in the United States in 1924 and was eradicated in 1925, made a second appearance in June, 1929. The outbreak involved eight premises in Morris County, N. J. It was so promptly diagnosed and suppressed that the losses were without economic significance. Eradication was effected essentially through the destruction of affected fowls, and the cleaning and disinfecting of premises. No other foreign livestock diseases gained admittance to the United States during the last fiscal year.

Eradication of Bovine Tuberculosis

Progress is being made in combating bovine tuberculosis, tick fever, hog cholera, sheep and cattle scabies, and various other domestic maladies. In the campaign against bovine tuberculosis more cattle were tested in 1928-29 than in any previous fiscal year. Nearly a million cattle a month were tested, the total in round figures being 11,665,000. The degree of infection found was 1.8 per cent, as compared with 3.9 per cent about eight years ago. These results and other data indicate that tuberculosis among cattle has been reduced more than 50 per cent since systematic eradication began.

Two States, North Carolina and Maine, were designated during the year as modified accredited areas; that is, areas in which tuberculosis infection among cattle has been reduced to less than one-half of 1 per cent. This was a significant demonstration that bovine tuberculosis can be eradicated from large areas. The work began with individual herds and was extended first to a county-wide and eventually to a state-wide basis of testing. Other States are rapidly approaching the goal attained by North Carolina and Maine.

Some 740 counties in the United States have attained the designation of modified accredited areas. The work is progressing in about 460 other counties. Thus area work has been completed or is under way in 1,200 counties, or considerably more than one-third of the counties in the United States.

State Action in Eradication Work

In nearly all States the legislatures were in session during the fiscal year 1929 and, with few exceptions, provided legal authority and appropriations to facilitate bovine-tuberculosis eradication. Some States modified their laws to make possible the extension of county-wide testing, so that all counties might have the opportunity to become modified accredited areas within the next few years. Moreover, State legislatures showed a tendency to increase the amount of compensation paid as indemnity to owners of cattle condemned as tuberculous. Federal indemnity was increased to permit a maximum payment of \$70 for purebred cattle instead of \$50 as before, and a maximum of \$35 for grade cattle instead of \$25.

Prevention of the spread of bovine tuberculosis by the summary destruction of diseased animals was held to be constitutional by the Supreme Court of Ohio in its recent decision in *Kroplin v. Truax*, 165 N. E. 498. Compensation to the owner is not a prerequisite to

the exercise of such authority, since the destruction of the animals is merely the abatement of a nuisance. If compensation is given, it is a mere gratuity. The decision in this case is in accord with prior decisions of the courts of other States. The principle of law involved now seems to be well settled.

It is necessary for a county recognized as a modified accredited area to qualify for reaccreditation after a period of three years. Under this provision 104 counties whose modified accredited status recently expired made further tests of their cattle. The results again showed that the degree of infection did not exceed one-half of 1 per cent, and indicated that areas in which tuberculosis has been reduced to a negligible quantity can be kept so by proper precautions. Ample funds for tuberculin-testing work during the coming year promise further progress.

Infectious Abortion

With the gradual suppression of tuberculosis, infectious abortion appears as the greatest plague now affecting our cattle industry. This disease takes an annual toll, from both beef and dairy herds, estimated at fully \$50,000,000. The disease also affects hogs. Hence the total damage is considerably more than the figure mentioned. No large part of the country escapes its ravages entirely, though the older dairy sections suffer most.

Stock breeders and dairymen manifest growing interest in the control of this baffling malady. Control methods based on present knowledge, though successful in many cases, have not proved practicable in all, owing to the labor, equipment, and expense involved. There is urgent need for a simple and effective means for combating the disease. Especially desirable is an effective and inexpensive system of artificial immunization. Encouraging experiments have been made, and further studies are in progress. Recent observations indicate that the eye may be an important channel of infection.

Increased appropriations for the study of infectious abortion were made available by Congress for the year ending June 30, 1930. The department will continue its independent investigations, and undertake in addition an expanded research program in cooperation with several State experiment stations. Both technical experiments and field trials will be made.

PACKERS AND STOCKYARDS ACT

As is the case with most new regulatory acts of broad scope, the Secretary's authority has been challenged in connection with the enforcement of the packers and stockyards act. This measure, passed in 1921, vests in him certain authority over packers, stockyards, and market agencies and dealers operating in public livestock markets. It is the policy of the department to obtain a ruling by the courts in all cases in which its orders under the act are questioned. One case was decided by the United States Supreme Court during the year; another is now pending in that court.

The case decided was that of the *United States v. American Livestock Commission Co. et al.*—the so-called Oklahoma boycott case. The decision, handed down May 20, 1929, sustained an order of the

Secretary against certain market agencies and livestock dealers operating at the Oklahoma National Stockyards. In this order, issued March 31, 1926, the Secretary directed the agencies and dealers concerned to cease using unfair or discriminatory practices in the purchase and sale of livestock. Specifically, the order prohibited the respondents from agreeing among themselves to refrain from dealing with the association. The market agencies and dealers urged that there was nothing to prevent their dealing or refusing to deal with whom they chose. With respect to this claim the Supreme Court said: "But we think it does not need argument to show that a boycott of a dealer in a stockyard may be an unfair practice under the act as it is found to have been in this case."

In the pending case—Tagg Bros. and Moorhead et al. v. The Secretary of Agriculture, commonly known as the Omaha rate case—the Secretary prescribed rates which in his judgment would be reasonable for the handling of livestock on a commission basis by certain market agencies on the Omaha market. The district court of three judges for the district of Nebraska upheld the right of the Secretary of Agriculture to prescribe reasonable rates for this service, and sustained the reasonableness of the schedule of rates which he had prescribed.

Its decision said:

For many years the agencies have operated under a schedule of rates fixed by their Omaha Exchange and undoubtedly the fact that rates are so fixed by an organization of which the commission men and traders are members and their customers, the livestock owners and shippers, are not, inclines public authority, to take a hand in the matter. * * * If the owners of the 58 firms or corporations comprising the respondents can, through a committee or whatever other machinery they see fit to adopt, arrive at rates to be charged the shippers, a disinterested governmental agency can fairly arrive at such rates. * * * There does seem to be an incongruity between the fact that commission men operate under uniform, fixed rates and yet make the claim that the sovereign power can not require that the rates be reasonable.

The respondents appealed, and a date has been set for argument before the United States Supreme Court.

ANIMAL-HUSBANDRY STUDIES

Animal-husbandry investigations carried on in the department now deal more largely than formerly with the business side of livestock production. Research projects no longer seek merely to determine which of two systems of producing farm animals is the better. They must tell the farmer and the stockman approximately how well each of the systems will pay. It has long been generally known, for example, that grass is the stockman's cheapest feed. Low feed costs are important. Experiments conducted under farm conditions have shown, however, that a ration costing the least per unit of gain on cattle, hogs, or sheep may not be the most profitable. Much depends on the quality of the finished product, on changing conditions in market demand, and on other factors. Results of a research project carried out in cooperation with the West Virginia Agricultural Experiment Station illustrate the point. Grass-fed steers that received a supplement of corn and cottonseed meal gained 39 per cent more and were 22 per cent more profitable than steers of the same age, weight, and quality fattened on grass alone.

The cattle that received supplemental feed had a slightly higher dressing percentage than those receiving grass only. As feeder cattle, as slaughter cattle, and as dressed carcasses, the cattle which received grain and a protein supplement graded consistently higher than the cattle fattened on grass alone. Studies of the meat produced in this experiment gave significant results. A mechanical test of the breaking strength of roasted rib muscle, and a report on the tenderness of the meat by judges of palatability, indicated that the animals given a supplementary ration produced the better meat. Besides demonstrating that the cheapest feed may not be the best, the tests showed what the better method is.

Investigations conducted in cooperation with the Purdue Agricultural Experiment Station yielded data pointing to a similar conclusion in the case of sheep. During the summer of 1928 the net return per lamb, above the cost of feed for both ewes and lambs, was \$6.66 more for a flock of sheep kept on pasture than for a flock fed grain and alfalfa hay in dry lot. However, a third flock was managed by keeping the ewes and the lambs on pasture and feeding the lambs grain in a creep. These lambs netted \$1.11 more per lamb than the lambs that had pasture only. These and other results from the experiments show not only the value of pasture and its profitability as a feed for lambs, but also that a grain supplement may increase the net returns, if the grain is not too high in price.

Growth of Wool and Mohair

Another interesting investigation dealt with the growth of wool and mohair. It showed that these fibers grow at varying rates during different seasons, the growth being least in the winter and greatest during the summer and fall. As the wool fibers grow longer they increase in diameter, a fact of importance both in production and in manufacturing. Studies are in progress to ascertain the influence of nutrition and management on the growth of wool and mohair.

Diet deficiencies in pigs and the relation of such deficiencies to the development of the teeth and the skeleton are being investigated. This work is conducted in cooperation with Johns Hopkins University and the American Dental Association. It has revealed that profound changes occur in the teeth and in general development when lime or phosphorus is lacking in diets otherwise adequate. This study gives promise of supplying more definite knowledge about animal nutrition, and also valuable information relating to human beings. Rachitis or "rickets" is a common disease of children evidenced particularly by weakness of the bones. Rachitis in swine is similar and probably identical. The feeding of swine rations deficient in lime salts, though otherwise complete, resulted in marked symptoms of this disease. Feeding rations deficient in phosphorus produces similar effects, though to a less degree.

Poultry Problems

Poultry problems are receiving increased attention. Particularly valuable results have come from experiments made to delay the molting time of laying hens by feeding them sulphur compounds. Sulphur is an important constituent of hens' feathers. It was believed

that giving proper quantities of a suitable sulphur compound might either delay the molt or cause it to have less effect on egg production at the season when eggs are high in price. It was discovered that a mixture of certain inorganic sulphur compounds increases the annual egg production of both pullets and laying hens. White leghorns given the sulphur mixture produced from 12 to 21 per cent more eggs in a year than other white leghorns not given the mixture.

Means of reducing losses caused by poultry maladies are under investigation. It has been demonstrated that pullorum disease, widely known among poultry owners as bacillary white diarrhea, may spread from chick to chick in the same incubator.

Studies of poultry parasites have furnished new knowledge concerning tapeworms and certain roundworms. Several species of snails, beetles, and grasshoppers have been found to serve as intermediate hosts for various internal poultry parasites. This knowledge emphasizes the importance of the prompt disposal of droppings. In short, the poultry industry is receiving the benefit of technical studies comparable to those heretofore made regarding the larger animals.

DAIRY RESEARCH

Recent investigations in the Bureau of Dairy Industry have developed new methods of controlling bacterial fermentations in the ripening of cheese. The use of these methods makes possible a great improvement in quality of cheese. Although about 20,000,000 pounds of Swiss cheese are made annually in the United States, it is necessary to import more than 15,000,000 pounds. The imported cheese is of the better grades and commands a higher price than the domestic product, much of which is defective in eye formation and flavor. Even factories that use the pure cultures of bacteria developed by this department turn out from 5 to 15 per cent of cheese that is defective because of abnormal gassy fermentations, or has a woody rather than a rubbery texture. The defective texture is associated with the use of bacterial cultures which induce a rapid formation of acid in the warm curd while the cheese is on the press. In order to suppress abnormal gas formation it is necessary to have an acid-forming culture which will check the growth of the undesirable bacteria. A new culture which is free from these two difficulties has been found. It survives the high temperatures of the cheese kettle and is actively growing when curd is put on the press. It begins acid formation before the gas formers are able to multiply. In a large number of laboratory and factory experiments this culture has invariably suppressed abnormal fermentations without impairing the texture of the cheese.

Under present conditions skim milk is a waste product in the manufacture of butter, and much of it also goes to waste in the production of market milk during seasons of surplus. One means of lessening this waste is the use of a process developed by the department for concentrating sour skim milk. Concentrated sour skim milk will keep without deterioration for several months and does not require special care. It is sold mainly as a poultry and hog feed, and many creameries and milk plants have found it profitable to make

the product by the department's process. In the last year the department has assisted a number of plants in establishing the process and has furnished many more with cultures and detailed directions. In making concentrated sour skim milk 27 plants utilized 76,000,000 pounds of skim milk in 1928, an average of nearly 3,000,000 pounds per plant. It is made also in some plants for which records are not available. Probably 100,000,000 pounds of skim milk were used in 1928 in making concentrated sour skim milk.

Cities Aided in Improving Milk Supply

During the year the Bureau of Dairy Industry aided many cities in improving their milk supplies. It advised them regarding legislation, the unifying of inspection systems, and the proper training of dairy inspectors. City and State milk ordinances were studied and tabulated, and information about dairy inspection was sent monthly to all dairy inspectors in towns and cities. Simple and efficient methods for producing and handling milk have been worked out by the bureau. A general policy of education among dairy farmers is necessary to get these methods widely adopted. Accordingly, the bureau has made comprehensive plans for community and state-wide educational programs to be carried on through the extension agencies of the State agricultural colleges.

Dairy herd improvement associations, in which the department is keenly interested, increased in numbers from 947 to 1,090 during 1928. This was a gain of 143 associations, or approximately 15 per cent. More than 465,000 dairy cows are on test in these associations for the economical production of milk and butterfat. Their average production in 1928 was 7,464 pounds of milk and 295 pounds of butterfat, or more than 60 per cent above the average production of all the dairy cows in the country. The records proved once more that high-producing cows return a high average income over the cost of their feed. Cows producing 500 pounds of butterfat per year ate more than twice as much feed per cow as did those producing 100 pounds, but returned more than fourteen times as much net income.

HOME ECONOMICS

The department through its Bureau of Home Economics during the last year continued and broadened its studies of practical, everyday home problems important to health and satisfactory living. Nutrition principles were expressed in daily menus, and recipes for the preparation of foods were tested. The food habits of children were studied and a bulletin prepared giving nutrition facts, menus, and recipes. In this work the department cooperated with the Washington Child Research Center, with mothers, and with children's institutions. Designs for children's clothing were published in department leaflets and popular articles. Cooperative relationships were maintained with manufacturers of patterns and ready-to-wear garments, so that mothers might purchase patterns or garments based on the designs.

The quality of family living depends almost as much on how the income is spent as on the amount of the income. Accordingly,

studies were made to help the housewife in planning and recording family expenditures. A bulletin was prepared describing various methods, and a supplementary, loose-leaf account book was issued to simplify the keeping of household records. A bulletin in preparation discusses family expenditures and gives typical budgets at different income levels. Two preliminary reports were made on how time is spent in the home. These were based on the records of 1,000 rural home makers. They will be followed by popular publications on the preparation of time schedules and the planning of household tasks. Some information on the equipment used in the home laundry and in the preparation of food was assembled, but much more is needed as a basis for advice on the wise choice of such equipment. Studies on home refrigeration compared the cost of operation and management of ice and mechanical refrigerators. Bacteriological studies showed the most desirable temperatures for the household refrigerator.

The relative utility and economy of agricultural products used in the home was studied. This work included palatability tests to determine the influence of methods of production and other factors on the palatability of foods. Tests of the palatability of meat were made to help producers determine how the most palatable meat can be produced most economically. Facts were thus established which should enable them eventually to produce the kind of meat that is most acceptable to consumers.

Rice Varieties Tested

In the handling of rice geographical preferences affect marketing. The department sought to determine whether methods of cooking might be so adapted to different varieties as to make them yield a finished product of comparable texture. Eight common varieties of rice were cooked under varying conditions. It was demonstrated that different varieties of rice cook differently, some more completely and in less time than others. This indicated the desirability of avoiding a mixture of varieties in grading.

Considerable information on the composition and the mineral and vitamin content of food products, and the relation of these factors to good nutrition was obtained. Studies of food composition were supplemented by special chemical analyses.

A special study was made of two agricultural by-products, rice polish and wheat germ, which are valuable sources of certain food nutrients. It was shown that these discarded germ portions are very high in vitamin B, especially in the antineuritic factor, so important in the diet of children. These parts of the grain are generally discarded or used as feed for livestock, largely because they tend to become rancid. By slightly heating germ portions and placing them in sealed containers, however, this rancidity can be prevented. Accordingly, recipes were worked out showing how the by-products in question may be used as food. This is particularly desirable where diet is likely to be restricted in either minerals or vitamin B. This process also affords a method of utilizing a valuable part of the grain without interfering with the usual method of milling white flour or polishing rice.

Utilizing Different Grades of Products

Efforts to develop uses for all the grades of different crops, so that the entire output may find a profitable market, produced significant results. The department suggested a number of uses for osnaburg, a fabric made from low-grade cotton, and the sale of this material was stimulated so that its increased manufacture absorbed more low-grade cotton. A study to determine the influence of the quality of cotton on the durability of fabrics was begun. This and similar studies should assist manufacturers to select the grade of cotton best suited to their requirements.

Study of food-handling costs resulted in recommendations for improvement. Education in the choice of foods, an important phase of home economics, necessitates keeping in touch with the home on the one hand and the food supply on the other. It is important to consider the food supply not only as a source of economic return to the producer but also as a source of adequate human nutrition. Also it must be regarded from the standpoint of the supply as a whole, rather than from the standpoint of a single group of commodities. The need for education in the choice of foods has been increased by unethical advertising used to promote the sale of special foods.

Food Expenditures Analyzed

In studies of the farmers' standard of living, recorded food expenditures were analyzed and material prepared for publication. A beginning was made in the study of food used by business and professional groups. Information is required also regarding the food habits of families in the wage-earning and clerical groups. Information about consumer demand under changing economic conditions should make it possible to estimate market requirements more closely, and thus to improve supply and demand relationships.

FUNDAMENTAL RESEARCH IN THE DEPARTMENT

As this is an annual report rather than a history of the department, it must be largely confined to the work of the last 12 months. But this rule can not be uniformly applied. It must be set aside entirely in reviewing research, for scientific inquiry can not be evaluated annually. It is essentially a long-time activity, which can be truly appraised only on a long-time basis. Much research started in the department and in the State experiment stations long ago is only now beginning to bear fruit. Years may pass before certain current studies yield practical results. Only by noting the outcome of research work over a long period can we form a just idea of its value. I shall therefore not restrict myself to the developments of a single year in dealing with the subject of research, but shall glance over the record of several decades.

Though some familiar facts may appear in the retrospect, the story as a whole will emphasize the latest application of the department's scientific discoveries. This phase of the matter changes constantly and increases steadily in economic importance. Scientists are accustomed to distinguish between fundamental research and studies having simply an immediate practical object. This distinction is

valid enough, but it sometimes inclines the layman to think that fundamental research is not practical. In reality it is practical in the highest and most permanent sense. It may therefore be worth while to chronicle some of the practical results of fundamental research done in the department. Time and again facts or principles thought at first to have only a scientific interest have turned out to be of revolutionary importance.

Fundamental research done in the Bureau of Animal Industry from 1888 to 1893 demonstrated that a microorganism found in the blood of cattle affected with Texas fever is the actual cause of the disease and that the cattle tick is the means whereby the disease is transmitted. This was the first demonstration that a microbial disease could be transmitted exclusively through the agency of an intermediate host or carrier. The discovery ranks among the great achievements of medical science, for it led to the knowledge that such diseases as yellow fever, malaria, typhus fever, African sleeping sickness, Rocky Mountain fever, magana, and others are carried through an intermediate host. The control of yellow fever in the Panama Canal Zone was thus made possible.

Achievements in Livestock-Disease Control

Studies begun in the same bureau in December, 1885, showed that immunity to a disease could be produced by the injection of killed cultures of bacteria. This result of fundamental research was later applied in vaccination against typhoid fever and other bacterial diseases. A technic was developed for the diagnosis of dourine in horses by means of a complement fixation reaction. This brought into use a reliable method for detecting animals affected with this and certain other insidious diseases. The test has had extensive application in this country, with gratifying results in the control and eradication of dourine of horses. It has served in detecting animals offered for import that harbored diseases not existing in this country. Later studies showed that botulinus toxin produced symptoms in horses identical with those of forage poisoning. This discovery opened a new field in the study of cerebrospinal meningitis, or forage poisoning in horses, and furnished new methods of prevention and treatment. The department recently proved that anaplasmosis, a disease of cattle, exists in this country, and the knowledge led to experimental methods of control and treatment. Previously stock owners had spent much money in treating animals sick of anaplasmosis with methods used for other diseases for which anaplasmosis had been mistaken. Though the problem is not settled, the new control measures seem to be keeping it in check to a certain extent. Further research may reveal the various carriers of the disease.

Other studies developed an effective immunizing agent—hemorrhagic septicemia aggrassin—against hemorrhagic septicemia or shipping fever of cattle. This product, now prepared commercially, has been an extremely reliable means of reducing losses from the disease. Approximately 3,900,000 doses were prepared in 1927, and over 3,700,000 doses in 1928. The product was manufactured to a greater extent than any other biological agent except blackleg

agressin. Its proved potency and extended use undoubtedly saved livestock owners large sums.

A research result roughly measurable in dollars and cents is the department's discovery that sodium hydroxide is a much more effective disinfectant against foot-and-mouth disease than compound cresol and bichloride of mercury, substances heretofore largely used. An enormous quantity of disinfectants is used in combating outbreaks of foot-and-mouth disease. In the California outbreak of 1924, 702 premises and more than 21,000 railroad cars were disinfected. Sodium-hydroxide, besides being a better disinfectant, costs only about one-fifth as much as compound cresol solution, and about one-third as much as bichloride of mercury.

Significance of Hookworm Discovery

Exceptionally important was the department's discovery of a new species of hookworm that is widely prevalent in the Southern States. This discovery opened a public-health problem that eventually led to the establishment of the International Health Board of the Rockefeller Foundation. Subsequently the department introduced carbon tetrachloride as a remedy for hookworm disease, and it has been used in treating more than 15,000,000 cases throughout the world. More recently tetrachlorethylene was recommended as being effective and safer than carbon tetrachloride. This is now receiving extensive tests.

Research in the department interpreted the phenomena of the large intestinal roundworm of human beings and swine. The new knowledge became the basis of a system of raising swine designed to protect these animals from roundworm infestation. This system, begun on a small scale in McLean County, Ill., in 1919, was gradually extended, with surprisingly good results. Observations on many different farms in the Middle West, involving studies of the litters of several thousand sows, showed that as many pigs can be raised from two sows under this system as are ordinarily raised from three sows under the conditions obtaining on most farms. The sanitation system produces thrifty pigs, of uniform size, practically without runts, whereas the ordinary system of raising swine produces many undersized pigs. This swine-sanitation system saves the farmers in the Corn Belt probably \$1,000,000 a year. It is being tested in the South, and has been adopted on many farms there.

Some diseases, among them bovine tuberculosis and infectious abortion, require prolonged study before their fundamental facts can be discovered. Certain basic facts regarding these two diseases have nevertheless been established by the department. It has been determined that many tuberculous cattle, even when outwardly in good health and condition, eliminate living tubercle bacilli in their feces through having swallowed infected material coughed up from their lungs. This showed how hogs become infected, and indicated necessary precautions. As this discovery revealed an important channel through which the casual agent of the disease is disseminated, its economic value is undoubtedly great.

Investigations of the cause of hog cholera were begun in the department as early as 1878. They were continued almost unin-

interruptedly, but without tangible practical results until 1903, when the fundamental discovery was made that hog cholera is caused by a filterable virus. Since then progress in the control of the disease has been rapid. A preventive serum has been developed which enables farmers to engage in hog raising with security against loss from hog cholera. Further research is required to determine the nature of the hog-cholera virus. It can not be cultivated outside the hog, and it can not be seen by the highest powers of the microscope. It passes through filters. If its nature were known, science could probably combat it more effectively.

Discoveries Regarding Mosaic Diseases

Knowledge of the so-called mosaic diseases of tobacco, tomato, cucumbers, potatoes, sugar beets, corn, wheat, sugarcane, and many other cultivated crops, including fruits, is the result largely of research on the part of department and experiment station workers. The mosaic diseases are caused by filterable viruses introduced by plant lice and leaf hoppers. Threatened industries have been reestablished by the breeding of resistant varieties of the affected plants. In this way the potato industry has been protected and the sugar industry of Porto Rico and Louisiana reestablished. It was first demonstrated by this department that resistance to disease in plants is a genetic character, and that resistant qualities can be bred into or out of plants. Wilt-resistant cottons and melons were the practical outcome. These varieties made it possible to grow cotton and melons in infected soils, and saved the money crops of large regions. The principle has been applied to many other crops and diseases.

Another discovery in the department made it possible to secure crosses of species whose blooming periods are so far apart that pollen can not be preserved long enough to secure crosses. This revealed that the flowering and the vegetative growth of plants are controlled by alternations of light and darkness, and that the time of flowering can be controlled by changing the length of the periods of exposure. Thus plants with flowering periods far apart can be brought into flower simultaneously. This is of value in hybridization and in other connections.

In 1916 the department became interested in the production of citric acid by the action of certain molds working on sugar solution. A laboratory process was developed which eventually made the United States independent of foreign domination in this important product. Italy in 1928 placed a tax on the export of citrate of lime to encourage home production of citric acid. In the same year the citrus crop in the Pacific States was so good that few culls were available for the domestic production of natural citric acid. An American manufacturer, using the process discovered in the department, met the domestic demand for citric acid, without an appreciable increase in the domestic price. Meantime England and other foreign countries had to pay export taxes to meet their demands for citric acid. Citric acid sold in England for as much as 65 cents a pound, while the price here remained at 46 cents. The estimated saving to this country was \$700,000. About \$3,000,000 worth of citric acid is produced annually by this method.

Calcium gluconate is coming to the fore in the medical administration of calcium. It has advantages not possessed by other salts of calcium, in that it can be injected into the skin or the muscles without causing necrosis of the tissues. Moreover it is the only tasteless salt of calcium. Calcium gluconate also shows promise for the administration of calcium to poultry and cattle. If this use develops, an enormous demand will arise for the product. A new chemical process for the production of gluconic acid and calcium gluconate has been developed in Switzerland, but this process is fully protected by patents in this country and constitutes a monopoly. However, a process has recently been developed in the department for the production of gluconic acid from glucose by means of molds. This acid, formerly a chemical curiosity valued at 30 cents per gram, can now be produced by our methods for little more than that per pound.

Results from Soil-Fertility Studies

Study of the nutritional requirements of the sugar beet led to the general use of superphosphate and other commercial plant foods on the sugar-beet lands of the West. The result is a large increase in yields per acre, and also a significant increase in the sugar content of the beets. Application of this research achievement brought increased prosperity to the growers and larger profits to the sugar-beet factories.

Until about 20 years ago it was believed that there was not much difference between the various proteins with respect to their nutritive value. To-day we know that of the 18 or 19 compounds called amino acids, of which proteins are composed, some are absolutely essential for growth and nutrition. Many proteins in some of our most important foods and feedstuffs have been found to be lacking or deficient in one or more essential amino acids. Conspicuous among these are the chief proteins in corn, wheat, several other cereals, and in some beans and in lentils. This new knowledge, which has revolutionized our ideas regarding the nutritive value of foods, was gained through fundamental research started in the Connecticut Agricultural Experiment Station, and supplemented by studies conducted in this department. The composition of many proteins in different foods and feedstuffs has been determined, and the percentages of the different amino acids estimated. More than 100 publications give the results, which are widely used by workers in dietetics and in animal husbandry. It is now possible to mix feedstuffs so that the amino-acid deficiency of one protein will be supplemented by adding to the ration another feedstuff which is rich in that acid. The practical value is extensive.

A new method for the production of phthalic anhydride, the most important raw material used in the production of many dye substances, was developed in the department in 1918. The process involved the catalysis of naphthalene into phthalic anhydride when naphthalene was converted into a gas and mixed with air. A public-service patent was obtained, and the process made the United States independent of foreign supplies of phthalic anhydride. More than 6,000,000 pounds of phthalic anhydride were produced

commercially in 1928 at a reduction in price representing an estimated saving of \$1,000,000 a year to the American public.

Utilization of Citrus By-Products

Research in the utilization of citrus by-products was undertaken to develop methods applicable particularly to conditions in California. Methods of obtaining lemon oil, orange oil, citrate of lime, and citric acid under American conditions, with machinery and mass production superceding the laborious hand methods employed in European citrus districts, were developed and demonstrated. The Citrus Growers Exchange of California applied the results in two large by-product plants. In a recent year one of these plants utilized more than 40,000 tons of cull lemons, and produced 2,000,000 pounds of citric acid, 65,000 pounds of lemon oil, and 30,000 pounds of pectin. In value these products exceeded \$750,000. Another company used 10,000 tons of surplus oranges in one year recently, and produced 50,000 pounds of orange oil, valued at more than \$100,000. This was done from materials which, prior to the department's discoveries, were waste products.

Results of epochal significance have been achieved in the study of nitrogen fixation. Though too technical for extended description here, some of the outstanding points in this field may be mentioned. Manufacturers of synthetic ammonia, for example, use a catalyst developed in the department. Study of high-pressure gas reactions has produced important data used by designers of machinery and by industrial chemists. Particularly valuable have been the results of investigations in the department regarding the ammonia-vapor content of nitrogen-hydrogen mixtures in contact with liquid ammonia under pressure. Data developed are used by synthetic-ammonia manufacturers in designing condensers for removing ammonia from the nitrogen-hydrogen gas mixtures.

Experiments made in the production of phosphoric acid by electric-furnace smelting of phosphate rock have had important industrial results. Other experiments in blast-furnace smelting of phosphate rock have likewise been applied industrially. Potash extraction by a sulphuric-acid method developed in the department is used commercially, as is also glaucosil, a by-product of potash extraction from greensand. The department helped to overcome the potash shortage resulting from the war by developing a method of potash extraction from silicate rock by calcination with lime or digestion with free lime under pressure. Analytical methods developed for using fluorine, borax, and phosphoric acid in fertilizers have been adopted by the Association of Official Agricultural Chemists and are in general use throughout the country. Apparatus developed in the course of this work is commercially manufactured and distributed.

Importance of Fundamental Studies

These are only a few of the benefits the Nation derives from fundamental research done in the department. A full recital would fill volumes. It is well to emphasize the material benefits that come from well-directed research, because the work requires material support. Nevertheless, a narrow view of the purposes of science

tends to defeat its object. Scientific investigations are sometimes most fruitful when directed merely toward the discovery of fundamental principles. Hence the ultimate justification in utility may be remote rather than immediate. Results will come, which can not be reckoned in advance. Results achieved as an unexpected by-product are often more important than those originally contemplated.

Heretofore the department has met a serious difficulty in its research work. Its technical men have not been authorized to shape or change the course of their investigations in accordance with changing requirements. They have been called on to justify proposed expenditures in terms of expected concrete advantages. This is always difficult and often impossible. Research, since it seeks to penetrate the unknown, is fundamentally inconsistent with any general attempt to foresee its results. Facts learned in the course of an investigation may alter its direction and open up new possibilities. Information gained in one study may profoundly influence the development of another. When research policies make no allowance for this fact, their potential utility is reduced. Fundamental research tends to be most productive and ultimately useful when it may be modified or expanded as its accumulating results may dictate.

Lump Sum for Research Desirable

It would be extremely helpful in the department's work if a lump sum, available until expended, were appropriated for basic investigations. This would permit lines of inquiry to be pursued uninterrupted even if a radical change of their direction became advisable. Under the present system, whereby research funds are appropriated item by item, more than a year must elapse after plans are made before the funds become available. If circumstances necessitate a change of plan, another delay occurs. Many research projects progress well enough under this system. Cases often arise, however, in which the lack of elasticity in the shaping of research programs involves costly delay or even an indefinite frustration of the objects in view. Our research heretofore has been largely developed to meet emergencies and to throw up a hurried defense against diseases and pests. It has yielded important results, as the facts I have given sufficiently attest. Unquestionably, however, this method of working should be supplemented by a continuous program of inquiry into basic principles. Such a policy would accumulate forehanded knowledge which would facilitate the solution of specific problems as they arose.

STATE EXPERIMENT STATIONS

In the State agricultural experiment stations the department has strong and resourceful allies. These State institutions obtain about one-fourth of their support from the Federal Government. Besides doing much work independently, they cooperate heartily with this department in research by division of effort and also by participating in unified plans. Work thus correlated shows gratifying results. Fully 12 per cent of the research projects of the experiment stations are conducted cooperatively with the department. In this

way two great systems for agricultural investigation function in close harmony in properly balanced and well-rounded research programs.

Great expansion and development of research at the State experiment stations has resulted from the Purnell Act of 1925, which opened new fields of investigation and made it possible to attack vital questions from many angles. Fundamental research as distinguished from studies having an immediately practical objective has assumed a larger place in the work of the experiment stations. This is in accord with the experience that investigations designed to establish basic facts and principles may have more practical significance than hasty attempts to settle farm questions by short-cut methods. Essentially the distinction is not between what is practical and what is not, but what is practical in a narrow and what is practical in a wider sense. Fundamental research may not affect agricultural practice quickly in all cases. Its ultimate value, however, is sure. Certain fundamental studies launched in the experiment stations have created nation-wide interest and have led to investigations over wide regions.

An example is a series of experiments conducted at the Missouri station several years ago to determine the run-off and erosion of soils under varying conditions. This inquiry yielded results which caused it to be taken up as a national project on an extensive scale. Thus enlarged the investigation has great promise of saving fertility and conserving water supplies. Another example is a fundamental inquiry on animal metabolism initiated at the Pennsylvania experiment station. This study likewise stimulated extensive and varied investigation elsewhere. Investigators at the Wisconsin station opened up a fruitful vein by studying differences in the effects of rations derived from various plant sources. These differences were traced to variability in the elements of nutrition now called vitamins, the importance of which has profoundly influenced our viewpoint in animal and human nutrition. Research results thus pooled in the common fund of scientific knowledge pay high dividends.

Stability in Financial Support

Prominent among the factors contributing to the scientific success of the experiment stations is the stability of their financial support. The amount of Federal funds expended by the stations is determined by basic legislation. Thus assured of continuing support, the stations can plan ahead with confidence. Under the supervision of local authorities they enjoy wide freedom in choosing subjects for investigation and in deciding how the work shall be done. They can direct research to specific ends, though it may take years to reach the goal. They can change the course of their inquiries as circumstances require. This does not mean, as some critics maintain, that research projects once authorized and started are never completed but become a continuous charge. In the last year the experiment stations reported the completion of 130 projects supported by Federal funds. In other words, opportunity for research to follow its logical course is quite consistent with definiteness and a reasonably limited range. Comparative freedom of inquiry and security of

funds have been found entirely compatible with a research policy looking toward the completion of projects.

The Purnell Act, which is supervised for the Federal Government by this department, has broadened the work of the State experiment stations to include a study of economic and social problems. This is an extremely important development, because the advancement of agriculture to-day can not be accomplished by technical progress alone. It is necessary also to maintain a proper adjustment between production and market requirements, to regulate the marketing of commodities, and to establish equitable relationships for agriculture in matters of taxation, transportation, tariffs, etc. It is therefore a good augury that the experiment stations are conducting under the Purnell Act an extensive and systematic study of the economics of production. They are investigating marketing practices, taxation, land utilization, and types of farming. In the last year more than 120 station bulletins were published on work of this character. Recent developments in agriculture have emphasized the fact that farm production, no matter how efficient, does not attain its proper end until the products have been profitably distributed. The economist and the production specialist must work in close alliance. Production experiments may be safely applied only when they have been proved to be economically sound. On the other hand, radical changes in farm practice can not be recommended for economic reasons unless they are supported on the production side. This necessity for coordination between production technic and economic science is a guiding principle in the work of the experiment stations as directed under the Purnell Act, and the resulting benefit should be very substantial.

Some Economics Studies Under Purnell Act

Research in home economics carried on by the experiment stations has received a strong impetus under the Purnell Act. Investigations are progressing covering all phases of the farm woman's activities. Foods and nutrition, rural home management, textiles and clothing, rural welfare and country living, and kindred subjects bulk large among some 100 separate research projects now going forward. In several States investigations have been started to determine the bread-making qualities of different wheats. Other inquiries have to do with the quality and palatability of meat. Two general types of nutrition projects, the first involving laboratory investigations and the second consisting of field studies of dietary habits, have been launched. Much interest has been aroused by experiment station work on the food habits of children. At the Massachusetts station an investigation of the food consumption and health of rural school children disclosed serious inadequacies. It led to a broad study of the feeding and transportation of children in elementary schools and aroused wide interest among school superintendents. An analysis of the food consumption and the expenditures of rural families is being made by several experiment stations in collaboration with the Federal Bureau of Home Economics. Work done at the Cornell station on farm standards of living was followed by a considerable grant of State funds to supplement Purnell Act funds in a more

extensive investigation. Promising inquiries are under way concerning the use and economy of electrical equipment in the farm home.

Stations in Outlying Territories

In the Nation's outlying territories and in the islands of Hawaii, Porto Rico, Guam, and the Virgin Islands, the United States Department of Agriculture maintains experiment stations discharging functions similar to those fulfilled by the State stations. Valuable service was given by the experiment station in Porto Rico in restoring the island's agriculture after a devastating hurricane in September, 1928. Coffee plantations suffered great losses by the destruction of trees. It became the duty of the experiment station to advise farmers in regard to the restoration of trees not too badly broken, the preparation of seed beds, methods of transplanting, choice of shade trees, use of fertilizer, etc. Losses to citrus and pineapple growers were lessened by prompt action taken to save trees that had not been too much damaged. Many trees that had been blown over were straightened, pruned, and supported until roots developed, and were stimulated to rapid growth by the application of fertilizers. Help in solving the food problem created by the hurricane was given by the experiment station. It advised farmers as to the crops that might be planted to secure early returns.

Authority for the Territory of Hawaii to share in the Hatch and supplementary acts was given by an act of Congress approved May 16, 1928. The legislature of the Territory designated the University of Hawaii to receive the funds thereby appropriated. It is required by the act that the station shall be conducted in collaboration with the Federal experiment station in Hawaii on cooperative plans approved by the Secretary of Agriculture. Accordingly, the two stations, by agreement between the department and the university authorities, were merged for the purposes of their agricultural work. This is known as the Hawaiian Agricultural Experiment Station and is conducted jointly by this department and the University of Hawaii. The director of the Federal experiment station became director of the joint institution. Several members of the university faculty were added to the staff of the experiment station. Various research projects to be undertaken by the new organization have been approved, and the work has started under favorable auspices. This arrangement should be advantageous to the Department of Agriculture, because it offers an opportunity to develop a strong experiment station where tropical investigations can be carried on.

By an act of Congress approved February 23, 1929, benefits of the Hatch Act are to be extended to the Territory of Alaska. It is provided in the law "that no appropriation shall be made until estimated by the Secretary of Agriculture, the estimates to be based on his determination of the ability of the Territory of Alaska to make effective use of the funds." Plans contemplate the establishment of a new station. An experiment station has been operated by the department since 1907 at Fairbanks, Alaska, and it is proposed that this shall be merged with the new organization. The

program, however, requires Territorial appropriations for buildings and maintenance, and for some enlargement of personnel, so that research work can be carried on after the department withdraws. A bill for that purpose was introduced in the Legislature of Alaska at its recent session, but it failed to pass.

INFORMATIONAL SERVICES

Since the final test of science is practice, it is obvious that the research done by the department depends largely for its value on the efficiency with which its results are communicated to the public. Accordingly close contact is maintained between the department's scientific workers and practical men in agriculture, industry, and trade through a comprehensive information service. In this way the practical applications of scientific discoveries are made known, and scientific workers everywhere are apprised of the results achieved by their coworkers in this department. Thus duplication of effort is avoided and discoveries in one field of knowledge exert an influence on other fields promptly.

Though most of the department's work has informational aspects, a distinction may be drawn between teaching such as is carried on by the extension services and the informational work carried on through publications, the press, radio broadcasting, motion pictures, weekly and monthly periodicals, lectures and articles by department workers, correspondence with individuals, regulatory law administration, and crop and market news, and outlook reports. This work has increased measurably during the last year, though not sufficiently to keep pace with the demand. In the last half decade the department's research and regulatory work, and some other activities, have grown much more rapidly than its facilities for publishing the results. In consequence publication work is heavily in arrears, and it is unfortunately necessary to hold many important manuscripts in abeyance. A recent study indicates that 1924 was the last year in which a good balance existed between the general activities of the department and publication of the results achieved. Funds available for printing and binding have not been increased since then, though annual expenditure for research has been increased by \$5,000,000, and the expenditure for department work in general, exclusive of Federal-aid roads, by \$20,000,000. Indications are that the accumulation of important knowledge will outrun publication facilities to a greater degree in the current fiscal year than it did in the fiscal year ended June 30, 1929.

Information work done by the department is nevertheless very extensive. In the last fiscal year it distributed free more than 25,000,000 bulletins, circulars, periodicals, and other publications. In addition the Superintendent of Documents sold more than a million copies at prices barely covering the cost of printing. Senators and Congressmen distributed the department's publications widely, particularly the Yearbook, which has a circulation of about 400,000 copies. This volume contains the annual report of the Secretary of Agriculture to the President and numerous brief articles on recent progress in agricultural science and practice, as well as much up-to-

date statistical material. The 1928 Yearbook was the third in a series intended primarily to inform the practical farmer about what is new in agriculture.

Publishing Research Results

The results of fundamental research conducted by the department are published in technical bulletins and in the *Journal of Agricultural Research*, and popular material is issued in farmers' bulletins, leaflets, and circulars. In the fiscal year 1929 the distribution of farmers' bulletins alone totaled more than eleven and a quarter million copies. Much additional material, both technical and popular, was issued in mimeographed form. Yet the appropriation for all the department's printing, for all its purchases of machinery required in mimeographing, multigraphing, etc., and for the salaries of editors and other employees engaged in informational work amounted to only about 0.8 of 1 per cent of the department's total appropriation. A recent study of the relative effectiveness of various extension methods shows that the printed word is by far the cheapest and quickest method of leading farmers to adopt better farm practices. It would be true economy to increase the department's facilities for informational work.

The Press Service

Public interest in agricultural questions has grown tremendously in recent years, and the press has carried much more agricultural material than previously. Accordingly the department's press service, a division of the Office of Information, has been able to reach a wider reading public with newspaper and magazine articles and other material prepared for daily and periodical publications. A study was made of the agricultural news, editorials, feature material, etc., carried in a number of important daily newspapers in the last seven days of June, 1929, as compared with the amount of similar material carried by the same newspapers in the corresponding seven days of June, 1919. The increase in agricultural news material alone in 11 important papers exceeded 90 per cent. There was also a large increase in editorial and feature material on agriculture and in agricultural market news. Much material supplied by the department's press service was carried regularly in the feature services of the large press associations, and numerous syndicates cooperated in distributing agricultural information. A gratifying aspect of this development was increased accuracy in agricultural reporting and feature writing. During the fiscal year the press service issued for general circulation or for wide circulation in farm journals and trade publications more than 1,000 mimeographed releases, as well as a weekly printed Clip Sheet and many special articles and reviews of department bulletins. It also issued weekly the *Official Record*, which reports department activities, and numerous statements by the Secretary and other department officials. The press service is in no sense a publicity agency in the usual meaning of that term. Its work is confined strictly to the dissemination of research re-

sults, current economic information, and other useful knowledge. Besides issuing prepared material, the department furnished data for numerous special articles by outside writers. Specialists in the department contributed more than 1,300 articles to various outside publications.

Developments in Radio Service

Outstanding developments took place during the fiscal year in the department's radio service. Chief among these developments was the inauguration of broadcasts through one of the great commercial chain-broadcasting systems. Previously the department's radio programs had been supplied to broadcasting stations in manuscript. In October, 1928, when the National Broadcasting Co. placed at the department's disposal a network of 17 stations for a 15-minute broadcast 5 days a week, it became possible for members of the department to broadcast material in person. Approximately 200 members of the department and 18 guest speakers appeared before the microphone in this broadcasting program. Thus timely material, including crop reports, outlook reports, etc., was brought to the attention of the farmers immediately. Much valuable information on farming and home making was widely broadcast. In January last a broadcast over a network of 38 stations extending from coast to coast gave nation-wide circulation to the department's national outlook report on domestic and foreign business and agricultural conditions. In June a network of 42 stations transmitted a program arranged in connection with the second annual national 4-H club camp. Manuscript radio programs distributed to broadcasting stations in various parts of the country gave additional radio circulation to the department's work. Special service on local agricultural problems was given to cooperating broadcasting stations.

COOPERATIVE EXTENSION

One of the strongest influences in agricultural improvement is the extension service. Through this agency the department and the State agricultural colleges cooperate in demonstrating to farming people the latest and best farm and home practices developed from the experimental activities of these institutions. Extension work is a relatively new educational development; yet recent surveys show that already more than 75 per cent of all farm families have been benefited by it in some manner.

In assisting farmers to attain the standard of living to which they are justly entitled, extension agents very properly devote their efforts largely to the development of programs of extension work which have for their aim a larger farm income. Results of economic studies made during the last 15 years have furnished extension workers with facts upon which numerous State, county, and community extension programs are based. During the year the organization of local farm enterprises, market needs, price trends, and other economic matters were studied to provide the extension agent with a basis for his recommendations for readjustments in the size, volume, or organization of farm businesses. Data issued by the department forecasting the intentions of farmers to plant crops and breed livestock were also largely used.

County agricultural agents advised more than 68,000 farmers regarding the organization of approximately 800 cooperative-marketing associations during the year. Counsel was also given to 2,136 cooperative-marketing associations that were previously organized.

In the Red River Valley of North Dakota, extension agents helped 1,168 farmers to purchase cooperatively 60,000 sheep. Thus, a new farm enterprise was established in a 1-crop farming area. North Dakota also marketed 250,000 pounds of wool cooperatively. In Minnesota, a cooperative purchasing association, organized with the advice and counsel of the extension agent, saved the farmers of Itasca County, \$16,000.

Extension effort was devoted to increasing the fertility of the soil through stimulating the use of lime, fertilizers, and green manure. As a result of demonstrations carried on by the extension force during the year more than 300,000 farmers adopted better soils practices for the first time, an increase of almost 27,000 over the number who adopted such practices for the first time last year. The application of lime continued to be one of the outstanding phases of soil improvement in the Central, Eastern, and Southern States. Farmers were helped in testing their soils for lime requirements and in purchasing limestone at reasonable prices. They were also taught the value of using high-analysis fertilizers. In fact, the change in many areas from low-grade to high-grade fertilizers has been due largely to demonstrations and campaigns carried on by the extension service.

Problems Given Special Attention

The problem of producing an increased supply of home-grown roughage for dairy cows again received much attention by extension workers; as did the growing of sweet clover and alfalfa hay and the improvement of pastures as a means of reducing feed costs. The control of diseases, especially tuberculosis of dairy cows and contagious abortion, was promoted through the cooperative effort of county extension agents and Federal, State, and county veterinarians. Better feeding, dairy-herd improvement through testing associations, sanitary production and care of milk, better-sires campaigns, better-breeding programs, and improved construction of dairy buildings were other phases upon which county extension agents centered their efforts during the year. Nearly 500,000 farmers accepted and put into practice the modern and efficient dairy methods taught by extension workers. Similarly, assistance was given to growers of fruit, vegetable, and field crops, to poultry raisers, and to producers of beef cattle, swine, and other livestock.

Farm life is not solely concerned with production, selling, and buying, but with many other features which make living in the farm home more comfortable, more attractive, more enjoyable, and more beautiful. Through its home demonstration agents located in many rural counties, the department comes in direct contact with the farm family, discovers their basic problems, and helps them to work out solutions. Health, for instance, is an important asset in rural contentment and efficiency. Home demonstration agents aided the rural home maker to select and prepare correctly the proper foods to maintain a well-balanced and healthful diet. From the standpoint

of both health and economy, farm people were urged to produce their own supply of eggs, milk, meat, vegetables, and fruit, to maintain proper storage facilities, to can perishable fruits and vegetables, and to home cure their meat. Demonstrations in breadmaking, meat cutting, the preparation of milk dishes, and salad making were given. Women were trained in meal planning, child feeding, maintenance of normal weight in children, the use of corrective diets, infant feeding, preparation of hot school lunches, and the use of a food budget. Instruction was given in sanitation, home nursing, and first aid, and child clinics and dental clinics were arranged in cooperation with local physicians, dentists, and nurses.

Home Improvement Assisted

As a means of conserving the home maker's time and energy and to give her more leisure for relaxation and constructive use, home demonstration agents helped many women to rearrange their kitchens, install modern home equipment, and to rearrange for greater efficiency the sequence of their daily tasks. Business methods were introduced in the farm home. The installation of inexpensive, practical lighting, heating, water, and sewage systems was demonstrated. Farm women were shown also how to improve the appearance of the farmstead, both inside and out.

Especially popular among women and girls were various phases of clothing extension work. These included the making, care, and renovation of clothes, the construction and trimming of hats, home dyeing, making of infants' and children's clothing, repair of furs, and other features which have brought to farm women and girls a better understanding of clothing in relation to health, harmony of color and design, suitability to the occasion, and economical buying.

Farm women took active interest in numerous other community activities seeking to promote the comfort and efficiency of farm families and better their social and economic life. They acted as demonstrators, assumed the responsibilities of local leaders, participated in community programs, attended short courses at the State agricultural college, took tours to neighboring homes demonstrating the best practices, made community exhibits, attended rally days, and sponsored picnics.

In addition to working with adult farm men and women, the extension service, through its boys' and girls' 4-H club work, provided an opportunity for juniors to participate in the benefits of extension activities. Like their parents and neighbors, these young farm boys and girls of 10 years of age and over met in groups, discussed their problems, presented solutions, and planned ways in which they could be of greater service to their communities. More than ever, 4-H club work was recognized by the public as a vital factor in the educational development of the farm boy and girl and an important force in the improvement of rural life.

During the year 46,670 groups were organized into 4-H clubs. The total enrollment was 663,940, an increase of approximately 44,000 over the enrollment in 1927. Of the number enrolled, 67.4 per cent completed all the work assigned to them, as compared with 64.4 per cent who completed the work in 1927. Assisting the co-

operative extension agents in training these club members were nearly 60,000 local leaders who voluntarily gave their time and effort to the work. Many of these local leaders were former club members.

Funds for Extension Work

The total funds available for cooperative extension work from all sources during the fiscal year were approximately \$22,918,200, an increase of about \$2,000,000 over those for the previous year. Approximately \$1,500,000 of this increase was in Federal funds and \$500,000 in State and county funds. The Capper-Ketcham Act of May 22, 1928, made \$980,000 of Federal funds available July 1, 1928, and Congress appropriated an additional \$280,000 of Federal supplementary funds. The remainder of the increase in Federal funds was for the employment of agents in counties in the flood-devastated areas. Of the total funds, 39 per cent, or \$8,978,363, was contributed by the Federal Government, and 28 per cent, or \$6,405,825, was from State appropriations to the agricultural colleges and other State agencies. The remaining 33 per cent, or \$7,534,012, came from county appropriations for extension work and from contributions by local organizations and individuals. About 94.5 per cent of all funds used for cooperative extension work in 1929 came from public sources.

The entire State field staff on June 30, 1929, numbered 5,691 persons, an increase of 530 during the year. Of this number 4,170 were located in the counties, of whom 2,452 were in county agent work, 1,167 in home demonstration work, 252 in boys' and girls' club work, and 299 in negro extension work. The work of county extension agents was supplemented by the work by 825 full-time and 212 part-time subject-matter specialists located at the State agricultural colleges. There were 409 supervisors and assistant supervisors and 75 administrative officers and assistants. During the year there was an increase in the field staff of 495 county workers, 2 administrative and supervisory workers, and 33 subject-matter specialists. Of the 495 new county workers added 77 were county agricultural and 57 assistant county agricultural agents, 12 negro county agents, 201 county home demonstration and 25 assistant county home demonstration agents, 17 negro county home agents, 95 county boys' and girls' club agents, and 11 assistant club agents.

Educational Films Distributed

From its motion-picture laboratories the department distributed more than 3,500 shipments of films during the year, which were exhibited to approximately 5,000,000 persons in all parts of the United States. In addition to lending films the department approved requests for the purchase of 298 films. These were bought principally by educational institutions and by foreign governments.

Twelve new films consisting of 26 reels were produced and released during the year. They included *Traveler's Toll*, *Naturalized Plant Immigrants*, *Home is What You Make It*, *Under the 4-H Flag*, *The Master Farmer*, *How About a Combine*, and several films on rust, barberry eradication, land clearing, testing bridges, care of chicks,

and bamboos. Motion-picture films on about 250 subjects covering all phases of farm and farm home life are now in active circulation.

The department showed exhibits to millions of people at 74 fairs and expositions widely distributed throughout the United States during the year. These exhibits utilized the newest devices to impart in an interesting manner the latest and most authentic information on a variety of agricultural subjects. Those which attracted the most attention and which were in the greatest demand during the year were the Milk Factory and the Brood Sow's Rebellion. The exhibits were representations of animals operated mechanically and synchronized with amplified talks.

A special exhibit was prepared for the Ibero-American Exposition at Seville, Spain. This exhibit portrayed agricultural methods used in the United States and featured such subjects as wheat, corn, cotton, tobacco, sheep and wool, poultry, hogs, livestock, sanitation, history and development of the livestock industry, dairying, road building, and experiment-station work. A new motion picture, Naturalized Plant Immigrants, was prepared especially for showing at the Seville exposition, and 25 of the department's films were shown there.

WEATHER FORECASTS

Issuing weather forecasts and warnings for the benefit of agriculture and commerce and of navigation by sea and air has been much facilitated recently by an increased use of radio communication. This has enabled the Weather Bureau to serve the farmers and the rural population and the general public with a promptness never before possible. Long-established services, such as the dissemination of frost warnings, harvest-weather forecasts, warnings of cold waves, and forecasts of minimum temperatures, have gained increased utility. The bureau's forecasts of storms and hurricanes and its flood-reporting service have likewise been more readily disseminated.

The furnishing of weather information for the benefit of navigation on large inland lakes and on the oceans has been carried on by the Weather Bureau for many years. It always has been difficult to get an adequate number of observations from ocean areas. Only by means of weather reports from ships can the conditions prevailing over ocean areas be determined and storm centers located. Marked developments were made in this work during the past year, largely as a result of a better understanding reached among national meteorological services. In 1928 representatives of the Weather Bureau participated in conferences held in Paris and London for the purpose of effecting better international cooperation. Officials of the meteorological services of the principal maritime nations of Europe attended the meetings and made arrangements whereby each country will engage a certain number of ships of its own registry on which observations will be taken daily at fixed hours and transmitted by radio. The ships selected will be equipped with standardized meteorological instruments and long-range radio apparatus.

The organization of such a cooperative service was first begun for the North Atlantic Ocean, and principally for the areas included in

the steamer routes between the United States and Europe. Previously few of the ships plying these routes furnished weather observations by radio. This made it difficult for the Weather Bureau to provide the information desired by shipping interests and to give adequate service in connection with trans-Atlantic airplane and dirigible flights. Frequently only two or three reports a day were available from this immense ocean space. Seldom were a dozen reports received.

Prospects for More Ship Reports

As a result of the new plan nearly 20 ships of United States registry, about 24 British vessels, and 5 French ships now report regularly twice a day. Many more, including those of other nations, will be engaged within a year. All the ships, regardless of nationality, radio their observations to the Weather Bureau in Washington when west of longitude 35°. When the ships are east of that line, the reports are radioed to some designated European meteorological office, which makes them available to other services by broadcast on established schedules. The reports received by the Weather Bureau are made available to European meteorologists by a bulletin broadcast twice daily from the Weather Bureau office through the Navy radio station at Arlington, Va. Besides the ocean data the bulletins contain weather observations made at a large number of land stations in the United States and Canada. In turn a bulletin containing European reports and the ship observations taken in areas east of longitude 35° is radioed from France for the benefit of the United States Weather Bureau. It is planned to extend the international organization to the Pacific and other oceans. At present reports from ships in the southern area of the North Atlantic Ocean, the Caribbean Sea, and the Pacific Ocean are obtained exclusively through arrangements organized by the United States meteorological service.

Aeronautical meteorology has expanded greatly since the passage of the air commerce act, which provides for designation by the Department of Commerce of various commercial airways and airports necessary for the air mail and other air transport. The act also provides that the Weather Bureau shall issue weather information and warnings necessary for safe flying over these courses. Accordingly the basic system of weather reports at 8 a. m. and 8 p. m. is now supplemented by more frequent observations from selected stations. The program, now well under way, provides for a model service along the great transcontinental airway from New York to San Francisco and Los Angeles, a zone about 300 miles broad. Seventy-five stations within this zone make reports at 3-hour intervals to certain major airports or control stations. Through radiobeacon and broadcasting facilities established and operated by the Department of Commerce, pilots in flight, even in thick weather, can pick up weather reports while holding their courses.

This intensified service is now being operated only on the transcontinental line. A similar service will be developed for the important feeder and transverse lines as flying over those lines develops and funds become available.

WILD-LIFE CONSERVATION

Wild life is both a recreational and an economic asset. Its conservation should be considered in all programs for the development of public and privately owned land and water areas. Fortunately this is coming to be widely recognized. Heretofore our dealings with wild-life resources have been wasteful and without forethought. Now a new era is upon us, characterized by a definite policy based on fact-finding through biological research. Public opinion sees the importance of replacing the former enormous waste of wild life by a constructive program of recreation and development associated with wise use. Such a program should emphasize the part that wild life can play in supplementing agricultural production, in adding to land values, and in maintaining opportunities for outdoor recreation. This can be done by increasing the production of wild life and conserving adequate breeding stocks.

Investigations conducted by the Department of Agriculture through the Bureau of Biological Survey have resulted in the accumulation of much valuable information. Continuous research enables the department to deal constructively with the problems of hunting or trapping seasons, bag limits, maintenance of breeding stocks, harvesting the annual crop of surplus wild life, and facilitating the maximum production of game birds, fur-bearing animals, and other mammals consistent with due regard to other interests. The department makes comprehensive studies of big-game animals such as elk, deer, and antelope, to ascertain their numbers, habits, movements, and food requirements. Attention is given also to the diseases and parasites of wild animals and to the influence of predatory creatures on game species. Waterfowl studies include surveys of the numbers, distribution, and migratory movements of geese, ducks, swans, coots, and other birds in this country and Canada. Six thousand volunteers report on conditions observed in waterfowl censuses, or operate trapping stations where, under permit, birds are banded and released as a means of learning about their migrations. Officials of the national parks of Canada, and other agencies in that country and in Newfoundland cooperate in the work.

The Necessity of Research

Research is necessary for the control of injurious species and for the protection of useful animals and birds. Investigations with this end in view have been carried on for nearly half a century. Comprehensive reports have been made on the food habits of more than 200 species and briefer mention of more than 500. This work is the foundation of our advanced bird-protective laws and regulations. In order that the number of beneficial birds may be increased, the Biological Survey studies their food supplies. Information thus gained about the food plants of wild fowl has led to the improvement of their feeding ranges and has solved many problems connected with the establishment of practical bird refuges. Bird attraction through the provision of suitable bird houses has been much studied, with notable results.

It has been demonstrated that by using relatively simple methods farmers can increase the production of game on land suited to

that purpose. Lands can thus be made desirable for leasing to sportsmen, a growing though not yet extensive practice in the United States. In pheasant farming it is possible to rear a small number of birds without the expensive equipment commonly required on pretentious game farms. Further study is necessary to develop better methods of handling small game on the farm. Research is in progress to learn the types of cover most favorable. Study of the diseases of wild birds is important. Such diseases sometimes cause the death of thousands of birds, especially migratory wild fowl, at concentration points. An example was the alkali poisoning of ducks in the Bear River Marshes, Utah. Investigations revealed the cause and indicated remedial measures. Studies of the food habits of animals throw light on their economic significance. It has been demonstrated, for example, that toads are about as valuable individually during their active season as are most birds. Certain species of snakes, at present widely persecuted, have economic value. Some small mammals also are beneficial.

In order to meet more effectively the obligations of the United States under a treaty with Great Britain, the Seventieth Congress passed a bill (45 Stat. 1222) to create in perpetuity absolute sanctuaries for migratory birds. This measure, called the migratory bird conservation act, authorizes appropriations for the examination of areas that might be suitable as bird refuges. It also provides for the acquisition of areas that are found through investigation to be adequate for the purpose of affording perpetual sanctuaries for migratory birds. The act contemplates a refuge-acquisition program extending over a period of 10 years and will result in the establishment of a Federal system of wild-fowl sanctuaries throughout the entire country. The investigational work is in progress. Field parties are making detailed reports on the variety, distribution, and abundance of aquatic and marsh vegetation. Land-valuation engineers are investigating areas found desirable from the biological point of view. This inquiry will indicate the feasibility of acquiring tracts for refuges by purchase, lease, or gift. Other studies necessary under the bill will accumulate additional information about the fly ways of the birds and their food requirements. Data already gained leave no doubt as to the most desirable refuge areas in the various stages of the migratory flights.

The McSweeney-McNary Act

One of the most far-reaching legislative measures taken in recent years for scientific research is the McSweeney-McNary Act (45 Stat. 699). Among other requirements, this act calls for a comprehensive study of fundamental biological facts and principles governing forest wild life. Accordingly the Biological Survey has planned an orderly and sustained investigation on forest fauna. This will seek to determine the kinds of birds, mammals, and other vertebrates that make up the animal population of forest areas.

Though the destructive work of rodents and predatory animals is the most conspicuous relationship between forests and forest fauna, it is not necessarily the most important. Frequently the beneficial activities of wild life overshadow the destructive activities. Hence the research program will pay much attention to the service rendered

by resident and migratory birds and by animals that prey upon destructive insects and rodents.

Gradual upbuilding of the wild life of Alaska is in prospect under the Alaska game law enacted in January, 1925. Alaska's game, fur, and bird life ranks among the most valuable of its products. Trapping is an important industry in most parts of the Territory. In large sections game animals and birds furnish an important share of the human food supply. These creatures were being rapidly depleted in numbers prior to the enactment of the Alaska game law. Some species were threatened with extermination. Work already done under the new dispensation is thought to have checked the decline of the fur and game animals. Continuation of the present policy should permit their increase. Prior to 1925 the fur and the game in Alaska were administered under separate and inadequate laws. The whole field is now under the jurisdiction of the Alaska Game Commission, whose policy is well supported by those interested in the development of Alaskan resources. Though carried on with limited personnel, the commission's law-enforcement work is excellently supported by the courts.

The commission constantly emphasizes the fact that the maintenance of an abundant supply of wild life is an economic advantage to Alaska and brings many other advantages. It has shown that under wise management large portions of the Territory that might otherwise be unproductive can produce valuable annual crops of fur and game indefinitely. Ready acceptance of these views by the people of Alaska has greatly facilitated the commission's work. During each of the past three bienniums, the Territorial legislature has appropriated large sums for stocking areas with valuable fur and game animals. Last year, through cooperation with the Biological Survey, 23 buffalo were shipped from the National Bison Range in Montana to Alaska. Four were put in the Reindeer Experiment Station at College, Alaska, and the rest were liberated near Fairbanks. The herd thrived on the natural feed of the region, withstood the rigors of the winter, and entered the new season in good condition. Increased protection for the big brown bears of Alaska is provided in regulations issued by the Secretary of Agriculture. At the same time landowners and stockmen are authorized to protect themselves and their property against these huge animals.

Fur Farming Well Established

Fur farming is now established in the United States as a permanent agricultural enterprise. It is carried on both as a side line to farming and as a main crop in areas unsuited to cultivation. Fur farms are operated in all sorts of locations, particularly in the cooler latitudes and in mountain country. Some large farms have been converted into fox ranches with hundreds of pens. Many small ranches are on general farms. It is estimated that about 5,000 farmers in the United States and Alaska raise one or more species of fur animals. The majority raise silver and blue foxes. The total investment in fur farming exceeds \$20,000,000, and last year fur farms in the United States and Canada produced approximately 80,000 silver-fox pelts. All persons interested in fox farming should carefully consider these facts, so that precautions may be taken to

avoid overproduction and serious damage to fur farming as a permanent industry. Steady development, however, seems desirable. As fur farming progresses—while on the other hand the haunts of wild life are restricted—the tendency of the fur trade will be more and more to obtain supplies from the fur farms.

Domestic rabbit production for both food and fur has developed in the last few years into an important industry in various parts of the United States, especially in California and the Middle West. Rabbit fur is in general demand, and a market exists for rabbit meat in parts of the country, notably in San Francisco, Los Angeles, Seattle, and Portland.

Predatory Animals

Predatory animals and rodents continue to take a heavy annual toll. It is estimated that coyotes, wolves, mountain lions, bobcats, and some stock-killing bears cause an annual loss of more than \$20,000,000. This figure allows for the inroads of predatory animals on game and on ground-nesting and insectivorous birds, as well as on sheep and lambs, cattle, pigs, and poultry. In 1916 the Biological Survey began to build up a field force for the control of predatory animals. Predatory-animal districts, each in charge of an experienced leader, were organized in the principal western livestock-producing States. Hunters are not paid on a bounty system, but devote their entire time to the work. Poison campaigns have been increased and made more effective. The result is a large reduction in the number of coyotes and other predatory animals in the sections covered. Livestock losses have decreased correspondingly.

Losses running into the hundreds of millions of dollars annually are caused by ground squirrels, prairie dogs, jack rabbits, pocket gophers, woodchucks, porcupines, mice, and rats. Control of these animals is one of the surest means of reducing the production costs and increasing the profits of agriculture. Much has been accomplished by the department in cooperation with farmers and other landowners. Rodent pests have been exterminated on millions of acres of valuable agricultural land. In the past year nearly 100,000 farmers took advantage of opportunities offered them to wage co-operative warfare on these pests under trained leadership.

Cooperative-Control Program

The Seventieth Congress called for an investigation as to the feasibility of a cooperative-control program extending over five or more years. The investigation was made, and a 10-year program was recommended. The object would be to prevent the constant reinfestation of cleared areas as well as to clear additional areas. Though complete eradication of predatory animals is not practicable, and in some areas is not desirable, a more comprehensive and drastic control policy than that now in force is required.

FEDERAL-AID ROADS

The Federal-aid program of road construction is being advanced as rapidly as the authorized funds permit. In the fiscal year ended June 30, 1929, the addition of mileage initially improved with Fed-

eral assistance amounted to 7,402 miles. This brought the total mileage initially improved since the inception of the Federal policy to 79,796 miles.

A portion of this initially improved mileage, to which aid was granted prior to the designation of the Federal-aid system in 1921, consisted of roads which were not of sufficient importance to be included in the system. To relieve the States of the further necessity of maintaining roads of this character, 485 miles were abandoned as Federal-aid highways during the past year, thus reducing the retained mileage to 79,311. The initially improved mileage has been further reduced by relocations made in the course of stage construction (the making of secondary improvements) by a total of 47 miles; and at the close of the year 1,168 miles was in course of further improvement. Hence the mileage which, for want of a better term, is classified as completed was only 78,096. At the close of the preceding year the mileage similarly classified was 71,074. Hence the net addition of "completed" mileage was 7,022.

Stage construction has become important in the Federal-aid program. It should not be confused with repair or reconstruction, but should rather be considered as deferred construction. The deferment is in accordance with a deliberate policy of construction by stages, a logical answer to the dual necessity for some improvement of a mileage as great as possible, and for the betterment of original improvements to keep pace with increasing traffic. Secondary improvements were completed during the year on 1,988 miles of road.

Increases in Various Types of Construction

The net increases in the several types of construction during the year were as follows: Graded and drained roads, 1,056 miles; sand-clay roads, 562 miles; gravel roads, 1,293 miles; water-bound macadam roads, 189 miles; bituminous macadam roads, 528 miles; bituminous concrete roads, 201 miles; Portland cement concrete roads, 3,101 miles; brick and other block pavements, 48 miles; and bridges, 44 miles; a total of 7,022 miles.

The total mileage classed as completed at the close of the year is as follows: Graded and drained earth roads, 11,667 miles; sand-clay roads, 7,033 miles; gravel roads, 28,991 miles; water-bound macadam roads, 1,616 miles; bituminous macadam roads, 4,845 miles; bituminous concrete roads, 2,194 miles; Portland cement concrete roads, 20,618 miles; brick and other block pavements, 866 miles; and bridges, 267 miles; a total of 78,097 miles.

The total cost of the 7,402 miles of initial improvements and the 1,988 miles of secondary improvements completed during the year was \$195,298,168, of which sum \$82,736,878 was paid by the Federal Government. These payments extended over the period of between one and two years required to complete the improvements. In addition to the payments made during the last year on these projects, payments were also made on other projects not yet completed. The total actual disbursements of Federal funds to the several States during the year amounted to \$82,097,380.

The expenditure of more than \$82,000,000 is approximately equal to the disbursements of the past several years. The sum apportioned for each of the years since 1925 has been only \$73,125,000 (admin-

istrative expense not included). A higher rate of expenditure has been made possible by a large unexpended balance carried over from earlier years. This balance has permitted construction costing from \$80,000,000 to \$90,000,000 annually. But the accumulated balance is now exhausted. It is therefore necessary to shape the construction program in accordance with the amount of the annual authorization. Unless the authorization—for the past several years \$75,000,000—is increased, it will be necessary materially to reduce the rate of road improvement. A reduction has in fact already occurred. Obligations incurred for new projects during the last fiscal year amounted to only \$70,429,896, the lowest amount annually obligated since the fiscal year 1923. For the first time since that year the amount obligated is within the amount apportioned. This curtailment foreshadows a reduced expenditure next year and in succeeding years unless the annual authorization is increased.

Construction Appropriations Authorized

Appropriations authorized for road construction in the national forests have for several years been limited to \$7,500,000. Of this sum, \$3,000,000 is reserved for building roads and trails required in the administration, protection, and development of the forests. The remaining \$4,500,000 is devoted to the construction of main highways extending through the forest areas to form necessary links in the Federal-aid and State highway systems, and to serve communities within and adjacent to the Federal reservations. Such highways constitute a system of 14,165 miles, of which 11,780 miles are in the 12 States of the mountain and Pacific groups and Alaska.

Including the 315 miles of such roads improved during the past year, the total thus far improved is only 4,091 miles. Much of the remainder is totally unimproved and practically impassable by motor vehicles. The current rate of improvement is the maximum possible under the present scale of appropriations, but it falls far short of the progress being made in the improvement of the adjoining Federal-aid and State highways. Forest areas thus tend to remain as barriers to transportation. A similar situation exists with reference to needed connections across Indian reservations and unappropriated public lands.

Federal aid was extended last year in the construction of bridges and their approaches covering more than 44 miles. The year's construction brought the total length of all completed Federal-aid bridges up to 267 miles.

Private Capital in Bridge Building

The construction of major bridges is an expensive undertaking which the State governments have difficulty in financing with current revenues. Faced with an urgent demand for the improvement of thousands of miles of roads, they often find bridge costs burdensome. In consequence, private capital frequently grasps the opportunity to supply the needed structures and charge toll for their use. A survey of all existing toll bridges made two years ago by the Bureau of Public Roads showed that more than half the number

were on the Federal-aid highway system—a condition to be expected in view of the traffic importance of these roads.

It is not sound policy to permit the establishment of private toll bridges at commanding locations on roads improved at great public expense. The ultimate cost to the public exceeds what the cost of public construction and operation would be.

If current State revenues are insufficient for bridge construction, needed funds can be borrowed on the security of anticipated returns in publicly collected tolls. Such borrowing can be done on terms more favorable than those usually available to private builders. Under a recent amendment of the Federal highway act Federal aid can be obtained for bridges financed in this manner. The sum to be raised by tolls can be thereby reduced by half. Whatever method may eventually be adopted, it is obviously desirable that the opportunities for the public construction of bridges should be examined before private construction is authorized.

Standard Signs for Roads

By agreement the highway officials of the several States and the Federal Government have adopted as a standard certain designs for danger and direction signs proposed by a committee of engineers appointed by the Secretary of Agriculture at the suggestion of the American Association of State highway officials. The standard designs are intended for erection on all routes of the United States highway system, which mainly comprises the more important sections of the Federal-aid system. Erection of like signs for similar purposes in all States traversed by the principal interstate routes would promote the safety and convenience of travelers.

In States where these signs have been erected official observation and the praise of travelers indicate that the expected benefits accrue. In several States, however, the plan has not been put into effect. Early action by these States would much increase the value of the improvement, half the cost of which may be paid by the Federal Government.

Planting of Shade Trees

Provision is made for the planting of shade trees in a recent amendment of the Federal highway act. At the request of the State highway departments, Federal funds will be allotted to pay half the cost of suitable plantings. This department will cooperate with State authorities in the selection of suitable varieties and in the planning and arrangement of plantings. Several States have proceeded independently in the planting of shade trees on highways and have effected great improvements at a relatively small cost. As yet, however, no State has called upon the department for financial assistance in such work.

ARTHUR M. HYDE,
Secretary of Agriculture.

FINANCIAL STATEMENT

Expenditures, Department of Agriculture, Fiscal Year 1929

Funds expended and obligated for work under the supervision of the Department of Agriculture conducted during the fiscal year which ended June 30, 1929, including road building, totaled \$172,898,690. These expenditures were distributed by organization units as follows:

TABLE 1.—*Expenditures classified by organization units*¹

| Organization unit | General activities (all objects except payments to States and road construction) | Payments to States (exclusive of Federal-aid road funds) | Road construction (including Federal-aid roads) | Total |
|--|--|--|---|---------------|
| Office of the Secretary..... | \$1, 176, 714 | ----- | ----- | \$1, 176, 714 |
| Office of Information..... | 1, 136, 893 | ----- | ----- | 1, 136, 893 |
| Library..... | 95, 675 | ----- | ----- | 95, 675 |
| Office of Experiment Stations..... | 397, 511 | \$3, 840, 000 | ----- | 4, 237, 511 |
| Extension Service..... | 1, 960, 751 | 7, 162, 936 | ----- | 9, 123, 687 |
| Weather Bureau..... | 2, 956, 269 | ----- | ----- | 2, 956, 269 |
| Bureau of Animal Industry..... | * 14, 349, 539 | ----- | ----- | 14, 349, 539 |
| Bureau of Dairy Industry..... | 611, 458 | ----- | ----- | 611, 458 |
| Bureau of Plant Industry..... | 4, 620, 811 | ----- | ----- | 4, 620, 811 |
| Forest Service..... | 11, 648, 227 | 2, 610, 414 | \$11, 154, 207 | 25, 412, 848 |
| Bureau of Chemistry and Soils..... | 1, 403, 007 | ----- | ----- | 1, 403, 007 |
| Bureau of Entomology..... | 2, 049, 558 | ----- | ----- | 2, 049, 558 |
| Bureau of Biological Survey..... | 1, 383, 942 | ----- | ----- | 1, 383, 942 |
| Bureau of Public Roads..... | † 826, 939 | (9) | 85, 085, 774 | 86, 512, 713 |
| Bureau of Agricultural Economics..... | 6, 074, 718 | ----- | ----- | 6, 074, 718 |
| Bureau of Home Economics..... | 147, 554 | ----- | ----- | 147, 554 |
| Plant Quarantine and Control Administration..... | ‡ 4, 312, 308 | ----- | ----- | 4, 312, 308 |
| Grain Futures Administration..... | 131, 359 | ----- | ----- | 131, 359 |
| Food, Drug, and Insecticide Administration..... | 1, 545, 134 | ----- | ----- | 1, 545, 134 |
| Seed Loan Office..... | § 5, 616, 992 | ----- | ----- | 5, 616, 992 |
| Total..... | 62, 445, 359 | † 13, 613, 350 | ‡ 96, 839, 981 | 172, 898, 690 |

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for forest taxation and timber insurance studies and for the acquisition of forest lands and lands for the Upper Mississippi River Wild-Life Refuge; all items under "Forest Service receipt funds" except those for road and trail construction and payments to States and Territories, and expenditures under "Road construction" for highway research are included under the head "General activities." The items for "Cooperative fire protection" (exclusive of forest taxation and timber insurance research) and for "Cooperative distribution of forest planting stock," heretofore classified under the head of "Special conservation," the two items heretofore included under "Colleges and stations," and the item for payments to States and Territories under "Forest Service receipt funds" are shown under the head "Payments to States." All expenditures heretofore classified under "Road construction," including those under the Federal-aid road act and supplemental acts (exclusive of amount for highway research) and the Mount Vernon Memorial Highway, and, in addition, the items under "Forest Service receipt funds" for road and trail construction, special road work in flood-devastated areas, and forest road and trail work paid from the general appropriations of the Forest Service, are included under the "Road construction" group.

¹ Includes \$3,946,130 paid as Federal indemnities to livestock owners for animals destroyed in connection with tuberculosis eradication, and \$5,623,661 for meat inspection.

² Includes \$314,079 for highway research, paid from appropriation for Federal-aid road construction.

³ Includes \$83,692,540, paid to State highway departments for Federal-aid road work, included under column "Road construction."

⁴ Includes \$1,268,000 for control of Mediterranean fruit fly.

⁵ Includes \$5,606,221 for seed and fertilizer loans to farmers in storm and flood stricken areas of South-eastern States, and \$11,771 for collection of seed loans.

⁶ See Analysis of Payments to States and Road Expenditures.

Analysis of Payments to States and Road Expenditures

An analysis of the figures included in Table 1 as payments to States and expenditures for road construction is given below. It will be noted that the item for Federal-aid road construction appears not only under "Road construction" but also under "Payments to States." It properly belongs in both groups and is repeated in this way so that the total for each group, when taken separately, may be obtained.

(1) *Payments to States*

Office of Experiment Stations:

| | |
|---|---------------|
| Payments to State agricultural experiment stations for research under Hatch, Adams, and Purnell Acts----- | \$3, 840, 000 |
|---|---------------|

Extension Service:

| | |
|---|-------------|
| Payments to State agricultural colleges for extension work under Smith-Lever, Capper-Ketcham, and supplemental acts.. | 7, 162, 936 |
|---|-------------|

Forest Service:

Payments to States under Clarke-McNary Act—

| | |
|--|-------------|
| (a) Cooperative protection of State and private timberlands against fire (exclusive of \$59,933 for forest taxation and timber insurance studies, shown under "General activities")----- | 1, 148, 091 |
|--|-------------|

| | |
|--|---------|
| (b) Cooperative distribution of forest planting stock----- | 75, 188 |
|--|---------|

| | |
|---|-------------|
| Payments to States and Territories from national-forest receipts for benefit of county roads and schools----- | 1, 387, 135 |
|---|-------------|

Bureau of Public Roads:

| | |
|---|--------------|
| Payments to State highway departments for road construction under Federal-aid road act and supplemental acts (exclusive of \$314,079 for highway research, shown under "General activities")----- | 83, 692, 540 |
|---|--------------|

| | |
|-------------------------------|--------------|
| Total payments to States----- | 97, 305, 890 |
|-------------------------------|--------------|

(2) *Road construction*

(a) Under Federal-aid road act and supplemental acts:

Forest Service—

| | |
|--|-------------|
| Construction of forest roads and trails----- | 9, 080, 510 |
|--|-------------|

Bureau of Public Roads—

| | |
|---|--------------|
| Payments to State highway departments for Federal-aid road construction (including \$1,595,161 for administrative expenses but exclusive of \$314,079 for highway research, the latter being shown under "General activities")----- | 83, 692, 540 |
|---|--------------|

| | |
|--|--------------|
| Total, Federal-aid road act (exclusive of highway research)----- | 92, 773, 050 |
|--|--------------|

(b) Under Forest Service appropriations:

| | |
|--|----------|
| Construction of roads and trails, under "General expenses" fund----- | 492, 094 |
|--|----------|

| | |
|--|----------|
| Construction of roads and trails for States (national-forest receipts fund)----- | 419, 179 |
|--|----------|

| | |
|---|-------------|
| Construction of roads and trails, under "Cooperative work" fund (contributions from private cooperators)----- | 1, 162, 424 |
|---|-------------|

(c) Under special appropriations administered by Bureau of Public Roads:

| | |
|------------------------------------|---------|
| Mount Vernon Memorial Highway----- | 76, 109 |
|------------------------------------|---------|

| | |
|--|-------------|
| Restoration of roads and bridges damaged by floods in Vermont New Hampshire, and Kentucky----- | 1, 917, 125 |
|--|-------------|

| | |
|-------------------------------|--------------|
| Total, road construction----- | 96, 839, 981 |
|-------------------------------|--------------|

Expenditures by Types of Activity

The total expenditure of \$172,898,690 for the fiscal year 1929, covering all work conducted or administered by the Department of Agriculture, was classified by types of activity approximately as shown in Table 2.

TABLE 2.—*Expenditures classified by types of activity*

| Types of activity ¹ | General activities (all objects except payments to States and road construction) ² | | Payments to States (exclusive of Federal-aid road funds) | Road construction (including Federal-aid roads) | Total | |
|--------------------------------|---|----------|--|---|--------------|----------|
| | Amount | Per cent | | | Amount | Per cent |
| Research..... | \$13,989,275 | 22.4 | \$3,840,000 | ----- | \$17,809,275 | 10.3 |
| Extension..... | 2,727,513 | 4.4 | 7,162,936 | ----- | 9,890,449 | 5.7 |
| Eradication or control.. | 12,267,299 | 19.7 | ----- | ----- | 12,267,299 | 7.1 |
| Service activities..... | 22,526,702 | 36.0 | 2,010,414 | ----- | 25,137,116 | 14.6 |
| Regulatory work..... | 10,954,570 | 17.5 | ----- | ----- | 10,954,570 | 6.3 |
| Road construction..... | ----- | ----- | (5) | \$96,830,981 | 96,830,981 | 56.0 |
| Total..... | 62,445,359 | 100.0 | 13,613,350 | 96,830,981 | 172,898,690 | 100.0 |
| Percentage of grand total..... | 36.1 | ----- | 7.9 | 56.0 | 100.0 | ----- |

¹ The work of the Department of Agriculture may be divided into six general classifications, as follows:

(a) Research: Investigations and experiments in animal and plant production, breeding, and improvement, in methods of controlling diseases, insects, and other animal and plant pests, of soil and fertilizer problems, farm management practice, marketing, and crop utilization, and other scientific studies and investigations of the fundamental problems of agriculture, horticulture, forestry, home economics, meteorology, road building, etc., by means of laboratory and field experiments.

(b) Extension work: Demonstration and educational work by means of county agricultural, home demonstration, and boys' and girls' club agents and through exhibits, motion pictures, or otherwise, with a view to the dissemination, by direct contact, of the information developed by the experiments and discoveries of the department and the various States.

(c) Eradication or control: Direct control or eradication of plant and animal diseases, insects, and other pests, through organized campaigns, either independently or in cooperation with State agencies.

(d) Service activities: Includes such activities as the administration and protection of the national forests, the weather service, market news and inspection services, crop estimating, seed loans, and other work of like character for the benefit of the public, not primarily involving research, extension, or the enforcement of regulatory laws and exclusive of road construction.

(e) Regulatory work: Administration of regulatory laws, including the food and drugs act, meat-inspection law, plant and animal quarantine laws, migratory-bird treaty act, cotton futures and cotton standards acts, grain standard act, warehouse act, and others.

(f) Road construction: Includes construction of the Federal-aid highway system and forest roads and trails under the Federal-aid road act and supplemental acts, the Mount Vernon Memorial Highway, special road work in flood-devastated areas, and forest road and trail work paid for from the general appropriations of the Forest Service, from national-forest receipts, and from funds contributed by Forest Service cooperators.

² The "General activities" column includes, in addition to expenditures reported in previous years under the designation "Regular work," the following items listed in past years under the special classifications mentioned below:

Research: \$455,969 for (1) forest taxation and timber insurance studies, heretofore shown under "Special conservation"; (2) forest investigative work, under "Forest Service receipt funds"; and (3) highway research, under "Federal-aid road construction."

Extension: \$53,481 for cooperation with States in farm forestry extension work under the Clarke-McNary Act, formerly shown under "Special conservation."

Service activities: \$1,728,166 for (1) acquisition of forest lands and lands for the Upper Mississippi River Wild-Life Refuge, shown formerly under "Special conservation"; for (2) improvement, fire protection, brush disposal, and other forestry work defrayed from funds provided by Forest Service cooperators; and for (3) refunds of deposits made by users of national-forest resources, under "Forest Service receipt funds."

³ 8.1 per cent of grand total.

⁴ Payments to State agricultural experiment stations under Hatch, Adams, and Purnell Acts.

⁵ Payments to State agricultural colleges under Smith-Lever, Capper-Ketcham, and supplemental acts.

⁶ Including \$3,946,130 paid to livestock owners as Federal indemnities for animals destroyed in connection with tuberculosis eradication, and \$1,268,000 for control of the Mediterranean fruit fly.

⁷ \$1,148,091 for cooperation with States in forest-fire protection, and \$75,188 for cooperation with States in distribution of forest planting stock, under Clarke-McNary Act; and \$1,387,135 for payments to States and Territories from national-forest receipts funds for benefit of county roads and schools.

⁸ \$83,662,640, paid to State highway departments for Federal-aid roads, included under column "Road construction."

⁹ See Analysis of Payments to States and Road Expenditures.

¹⁰ Grand total.

Special Corn-Borer Clean-Up Campaigns of 1927 and 1928

By act of February 23, 1927, an appropriation of \$10,000,000 was provided for the purpose of assisting the States infested with the European corn borer in a special clean-up campaign looking to the control of this pest. Complete figures are now available covering expenditures for control operations under this special fund for work conducted during each of the fiscal years 1927 and 1928, as follows:

| | |
|--------------------------------------|---------------|
| Fiscal year ended June 30, 1927----- | \$3, 867, 837 |
| Fiscal year ended June 30, 1928----- | 5, 563, 317 |
| Total----- | 9, 431, 154 |

In addition to the above items, approximately \$145,000 of the balance of this \$10,000,000 appropriation was used during the fiscal year 1929 for researches on various phases of the corn-borer problem, which amount is included in the total for "General activities" of the department in Tables 1 and 2. Of the remainder of this balance, \$250,000 is authorized to be expended for corn-borer research and \$50,000 for control operations during the fiscal year 1930, leaving available approximately \$125,000 of the \$10,000,000 fund for the fiscal year 1931, if reappropriated.

Income from Department's Activities, Fiscal Year 1929

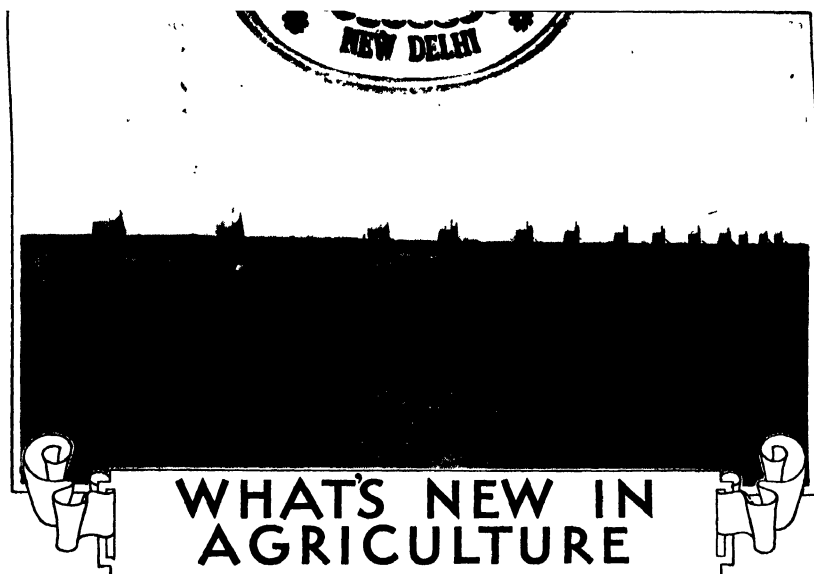
Incident to the department's work during the fiscal year 1929, receipts totaling \$9,765,527 were covered into the Treasury and fines were imposed and judgments recovered by the courts amounting to \$172,890 in connection with the enforcement by the department of the regulatory laws which devolve upon it for administration and execution, as follows:

(1) Receipts

| | |
|---|---------------|
| (a) Deposited to credit of miscellaneous receipts fund: | |
| From business on the national forests----- | \$6, 299, 802 |
| Contributions from private cooperators, appropriated as a special fund for road and trail construction, fire prevention and suppression, brush disposal, and investigative work on national-forest and privately owned lands----- | 1, 831, 827 |
| From other sources----- | 1, 037, 283 |
| | <hr/> |
| | \$9, 168, 912 |
| (b) Deposited to credit of applicable funds of department: | |
| Fees collected for classifying cotton, deposited to credit of revolving fund for conducting that work----- | 200, 728 |
| Reimbursement to various department appropriations for expenditures made therefrom----- | 395, 887 |
| | <hr/> |
| | 596, 615 |
| Total receipts----- | <hr/> |
| | 9, 765, 527 |

(2) Fines

| | |
|---|-------------|
| Fines imposed and judgments recovered by the courts in connection with violations of statutes intrusted to Department of Agriculture for enforcement----- | 172, 890 |
| Total income from activities of Department of Agriculture--- | <hr/> |
| | 9, 938, 417 |



AGE Not a Barrier to Adoption of Improved Methods, Survey Shows

The extension teaching carried on by the United States Department of Agriculture in cooperation with the State agricultural colleges aims to reach the rural people of all ages from the youngest member of a 4-H club to the oldest man or woman actively engaged in farming or in the management of a rural home. Do all of the various age groups make approximately the same use of extension information or do the younger farmers and farm women make changes more readily? This is an important question in the minds of those charged with the administration and supervision of extension work, and to those legislative bodies charged with the responsibility of financing the work. If changes in agricultural and home economics practices are primarily associated with youth, perhaps more emphasis should be placed upon work with young people, and less emphasis upon extension activities with those somewhat advanced in age. A background of experience in farming and home making may be necessary before wide use is made of extension information.

Information is available on the extent to which farmers and farm women on 1,636 nonselected farms in representative sections of Kansas, Michigan, Rhode Island, and Illinois have put into practice the teachings of the extension service and on the ages of these farmers and farm women.

Age of Farmers and Agricultural Practices

Dividing these farmers into eight groups with an age difference of five years each, it is found that of 147 farmers in the youngest group (30 years and less) 76 per cent changed practices due to information made available through the extension system, as compared to 77 per cent of the 175 farmers from 31 to 35 years old, and 77 per cent of the 232 farmers from 36 to 40 years of age. Of the 233 farmers ranging in

ages from 41 to 45, 79 per cent changed practices; of 216 farmers 46 to 50 years old, 72 per cent changed practices; of 190 farmers 51 to 55 years old, 76 per cent changed practices; of 167 farmers 56 to 60 years old, 71 per cent changed practices; and of the 276 farmers 61 years of age and over, 66 per cent changed practices. The percentage using extension information decreases slightly with advancing years, but does not fall below 70 per cent until the sixtieth year has been passed. In spite of any lessened physical activity due to advancing age, it is interesting to note that nearly as high a proportion of the farmers over 50 years of age made use of information derived from the county agent or other representatives of the extension service as of those less than 50 years of age.

Age of Farm Women and Home Economics Practices

While the volume of home economics extension done in the areas studied was somewhat less than the volume of agricultural extension, about the same condition exists in the proportions of women in the different age groups making use of extension information. Of the 235 farm women in the youngest group (30 years and less) 28 per cent changed home economics practices due to information made available through the extension system, as compared to 41 per cent of the 211 farm women from 31 to 35 years of age and 35 per cent of the 251 farm women from 36 to 40 years old. Of the 216 women ranging in ages from 41 to 45, 35 per cent changed practices; of 224 farm women 46 to 50 years old, 28 per cent changed practices; of 136 women 51 to 55 years of age, 27 per cent changed practices; of 150 women 56 to 60 years old, 26 per cent changed practices; and of 144 women 61 years old and over, 17 per cent changed practices. The age groups beginning at 46 and extending to 61 years and over made approximately as much use of information relating to better home economics practices as did the farm women of 30 years and less. However, the very young farm women and the older age groups did not change practices quite as extensively as the age groups from 31 to 45 years.

Learning Not Confined to the Young

These data tend to disprove the old idea that learning is largely associated with youth. Farmers and farm women are desirous of making use of information which will be of assistance in connection with farm and home problems, regardless of their ages. It is probable that a higher proportion of the older men and women own the farms they operate, which might account for some increased interest in better farm and home practices. The younger farmers and farm women have had the advantage of more formal educational training which probably more than offsets the question of condition of land occupancy. Men and women of all ages have learned to drive automobiles and to build or operate radios. It is not a question of age but of desire to do the thing, and it is doubtless this same motive which has led farmers and farm women to employ extension information in solving farm and home problems.

M. C. WILSON,
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Office of Cooperative Extension Work.*

AGRICULTURE in U. S. The present tendencies in the agriculture of the United States may be Specializing More and Using More Machinery briefly summarized as follows: (1) To reduce the number of farms and the area of land in farms, (2) to use more machinery and less labor where possible, (3) to use more science in production, (4) to specialize in production for market, (5) to continue the westward shift of production, and (6) to produce more foodstuffs and less feedstuffs, and to make other changes in production to meet changes in demand.

The marked postwar decline in the profitability of agricultural production has driven many farmers to the city, and caused farms to be consolidated or abandoned, reducing the number of farms and the number of acres in cultivation. The number of farms in continental United States declined from 6,448,000 in 1920 to 6,372,000 in 1925; and the land in farms declined from 956,000,000 to 924,000,000 acres. Reports to the Department of Agriculture indicate that farm population declined from 28,980,000 to 27,510,000 between January 1, 1925, and January 1, 1929. It is therefore probable that the census of 1930 will show that the number of farms and the land in farms have continued to decline since 1925.

Increased Investments in Machinery

Relatively high wages, on the one hand, and improvements in machinery and relatively lower prices for machinery, on the other hand, have induced many of the farmers remaining on the farms to invest more heavily in machinery to replace hired labor. Farm wages are now about 174 per cent of pre-war wages, whereas the prices of machinery used on the farm average 162 per cent of pre-war. Development of the use of the gasoline engine and improvements in farm machinery generally have been important factors in the movement to employ more machinery and less labor. The value of machinery on farms in 1924 was more than double that of 1910. Allowing for an increase in the price of machinery, it appears that on the average each farmer in 1925 was using about 40 per cent more machinery than in 1910. The use of machinery has greatly increased since 1925. It is estimated that the number of tractors on farms has increased from 507,000 to about 853,000. The combine, having been adapted to the conditions of harvesting on the Great Plains and farther east, is increasing rapidly. Many other implements and tools have been modified to use with the gasoline engine so that a farmer can do more work with them in fewer hours. These machines have made it possible for the farmer to dispense with many days of hired labor, and it seems probable that the amount of hired labor on the farm had been reduced 25 to 30 per cent by 1925 and further reductions have been made in the past few years.

More Production on Less Land With Less Labor

It is interesting that fewer farmers, with less labor, on fewer acres, continue to increase production. In the four years 1925-1928 agricultural production has averaged about 16 per cent more than in the period 1919-1922. In large measure this increase is to be attributed to better farming. The teachings of the agricultural colleges and experi-

ment stations are bearing fruit. The farmer knows more about his soils and the plants and animals with which he deals. He is in better position to combat pests and apply his labor more efficiently so as to secure larger returns in volume of production per unit of labor or capital employed. He is using more fertilizer. Expenditures for fertilizers in 1924 were more than double those for 1909. Taking into account changes in price, it appears that the volume of fertilizer purchases in 1924 was nearly 60 per cent greater per farm than the quantity purchased in 1909, and doubtless purchases have increased materially since 1924. The farmer is feeding his livestock better rations. This is indicated in part by an increase in feed purchases. Apparently the average farmer bought nearly 70 per cent more feed in 1924 than in 1909. He is learning not only better to feed his land and his livestock but also to select and plant better seed, and to breed and feed better animals.

Another marked tendency is to specialize in production for market, which tendency is accompanied by an effort to improve the quality of the product. The farm orchard, for example, is disappearing. Large areas of carefully planted, well tilled, well pruned, and properly sprayed orchards in locations favorable for fruit production have largely taken the place of the farm orchards scattered throughout the country. Similarly, the production of potatoes has shifted largely from the farm garden or small patch in a field to highly specialized areas where conditions are peculiarly suitable for the production of potatoes. To a considerable extent the farm garden has been superseded by specialized vegetable production. In the cities fresh vegetables are to be had the year around. Beginning with the winter months, supplies come from Mexico, Texas, Florida, and nearby islands. As the season progresses, the supplies come from areas farther north. The growth in specialized production of fresh vegetables for market is typified by the increase in the car-lot shipments of tomatoes, a highly perishable product. Shipments of tomatoes have increased from 18,000 cars in 1920 to over 30,000 in the past two years. The continuation of the rapid growth of large industrial and commercial cities, together with improved transportation facilities, makes fairly certain the continuation of this tendency to specialize in production for market.

Westward Shift in Cotton and Wheat

The westward shift in the production of the great staples, wheat and cotton, continues. The adaptation of the combine for use on the Great Plains has given great impetus to the expansion of wheat production westward on the Great Plains. Cotton production continues to expand westward in Texas and Oklahoma. In the meantime the dairy industry and other types of more intensive production continue their westward march, taking the place of cotton in the Southeastern States and of wheat in the North Central States. Since foreign competition in the production of cotton and wheat is increasing, while the domestic demand for fruits, vegetables, dairy products, and poultry products is also increasing fairly rapidly, there is a tendency for the westward expansion in the production of cotton and wheat to be offset by reductions in the production of the Eastern States.

The outstanding development in crop production of the past few years has been an increase of about 50 per cent in the volume of truck-

crop production. This has been in response not only to a rapid growth in the commercial and industrial population of the country but also to changes in the diet of the masses of the people. The appeals of physicians and students of nutrition to eat more vegetables have had a marked effect upon the demand for fruits and vegetables. Likewise, there has been a great increase in the demand for dairy and poultry products. Among the meats the most important development has been a pronounced increase in the demand for lamb, which has greatly stimulated the production of lambs for market. War conditions stimulated the demand for pork and pork products, but recovery of European production after the war and a great increase in the use of vegetable oils and fats are weakening the demand for hogs, both in foreign countries and in the United States.

The demand for hay and some other feedstuffs has been weakened by a great reduction in the number of horses on account of the increasing use of the gasoline engine. The expansion in dairy and poultry production would tend to increase the demand for corn and oats, but this tendency has been offset to a considerable extent by an increasing use of by-product feedstuffs, such as beet pulp, cottonseed meal, linseed meal, and wheat offals, in the balanced ration for the dairy cow and the hen. Such shifts and changes in demand are continuous, and production, to be profitable, must be planned in view of what the producer and the market require.

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Bureau of Agricultural Economics.*

ALFALFA Weevil Spreads in Alfalfa-Growing Sections of the West

The first question which arises in connection with an insect pest newly introduced from foreign shores is "How can its spread be prevented?" In the case of the alfalfa weevil, which was first discovered in North America about 1905, the answer has never been found. Although it has taken 20 years for this insect to travel from Salt Lake City, Utah, to eastern Wyoming on the one side and to California and western Oregon on the other, its progress has been unbroken. It spreads with equal facility through cultivated valleys, desert plains, and ranges of mountains. Natural barriers for it do not exist, and all human attempts to check it have proved ineffectual. On the other hand, it profits but little from artificial aids to its progress. Although hundreds of railroad cars and automobiles carry weevils, and some of them go to the remotest parts of the United States, only four colonies are known to have been established at a distance, and three of those colonies have now been absorbed in the natural onward movement of the insect.

Fortunately, man's efforts have been more successful in preventing the destruction of fields already infested. At first by cultivating and dragging the fields and in later years by the application of arsenical sprays and dusts, it has been found possible, at comparatively slight cost, to prevent the insect's ravages, which, indeed, were never quite so serious as they have sometimes been represented. The fields in which the damage done by this weevil is most conspicuous are not always those in which the insect consumes most alfalfa, but are often those in which the stand has already been nearly choked out by grasses and

dandelions. In such fields the weevil destroys a little alfalfa and leaves nothing but weeds, but it gets credit not only for the destruction it causes but also for the condition it discloses. The cases where permanent injury has been done to the field are comparatively rare.

After allowance is made, however, for imperfect cultivation, lack of fertilizer, nonrotation of crops, and uneven irrigation, the effects of which have been mistakenly attributed to the alfalfa weevil, it is still a costly hindrance to alfalfa production in extensive parts of Oregon, Idaho, Nevada, Utah, and Colorado. There are also cases where the attack upon the second growth of alfalfa, together with the owner's attempts to produce growth by excessive watering without first killing the larvae, have caused the stand to be choked out by weeds and permanently depleted. The direct loss caused by the feeding of the larvae, too, while it is in many localities less severe than in the early years of the insect's history in North America, is still sufficient to make spraying and dusting necessary. The intermittent character of the attack in late years, instead of being an unmixed benefit, has in fact made the control of the pest less effective, because the uncertainty has often prevented farmers from making the required preparations.

The present work of the Department of Agriculture upon the alfalfa weevil is directed chiefly toward tracing its spread, adapting the standard control methods to conditions which arise in newly infested regions, and studying the natural conditions which in certain seasons promote its attacks and render control measures necessary.

GEORGE I. REEVES,
Senior Entomologist, Bureau of Entomology.

APPLE Industry of Japan Founded on American Varieties Throughout the development of apple growing in all lands the variety factor has figured largely. In nearly every country where apple culture has grown into an established industry, varieties of local or regional origin have been developed which have superseded in varying degrees the introduced varieties with which the industry was initiated. This general trend of development, however, is not inconsistent with the fact that varieties of American origin are more or less extensively planted in various other countries, especially in those in which the industry is relatively new, even though varieties of regional origin are also grown. In Japan a comparatively small but regionally important apple industry has been developed on the basis of American varieties. The native apple in Japan is a small, inedible fruit; consequently, apple culture in that country was initially dependent upon introductions from abroad, as in the case of most other countries, but the manner in which those introductions were made constitutes an interesting bit of pomological history not generally known.

In 1870 the governor of Hokkaido (until about 60 years ago called Yezo or Yesso and still sometimes so designated), the island just north of the mainland of Japan, visited the United States and was so impressed with conditions here that on his return the following year he took with him as one of his chief advisors in the development of that island Horace Capron, then commissioner of the United States Department of Agriculture, who resigned that position in order to accept the invitation to go to Japan.

Soon after his arrival in Japan General Capron was invited to an audience with the Emperor, who gave him a commission to take charge of the "measures for agriculture in Yesso."

In connection with this work, General Capron associated with himself a number of specialists from America, among whom were Louis Boehmer as horticulturist, and Edwin Dun (later to become United States minister to Japan), who went in 1873 to take charge of the agricultural crop and livestock work. In 1877 William P. Brooks,¹ later and for many years thereafter director of the Massachusetts Agricultural Experiment Station, became connected with what was then the Sapporo Agricultural College, now a university, which was started on the advice of General Capron.

At the very beginning of this development in 1871² there were imported, probably as trees and plants from a nursery in western New York, 75 varieties of apples, 53 of pears, 25 of cherries, 14 of plums, 30 of grapes, 14 of raspberries, 5 of blackberries, 8 of gooseberries, 10 of currants, and several varieties of apricots and peaches.

American Stock Sent to Japan

All of the plant material, representing a great diversity of crops, was sent to a receiving station located in the suburbs of Tokyo. There the fruits were propagated in extensive nurseries. In 1875 much of the nursery stock was distributed, going largely to farmers in Hokkaido but also to the northeastern provinces of the mainland. According to Mr. Dun,³ some 2,000,000 fruit trees were thus distributed, many of them, however, going to farmers, as has been the case elsewhere, who had no appreciation of them and to whom they meant little or nothing.

However, in due time apples from the more favorable sections, especially from the region of Aomori in the extreme northern part of the main island, and from Hokkaido, began to appear in the markets in Tokyo and elsewhere. In subsequent years those sections have become the principal apple-producing areas of Japan, the fruit grown consisting entirely of American varieties, most of which, even if not all, were undoubtedly in the collection imported in 1871 from New York. However, only a few of the 75 varieties that composed that collection have persisted.

Apple Production in Japan

According to T. Susa,⁴ horticulturist in charge of the Aomori Experiment Station recently established there, who visited this department in 1927 shortly before returning to Japan, after having studied in this country for about two years, the annual production of apples in the Aomori district is about 5,000,000 bushels, while the island of Hokkaido, Chosen, and southern Manchuria produce in relative importance in the order named, about 3,000,000 bushels, making the annual total for all of Japan average about 8,000,000 bushels. The principal varieties and their relative importance are: Ralls (*Ralls Genet*), 50 per cent of the total; Jonathan, 30 per cent;

¹ Letter from Doctor Brooks dated Jan. 23, 1928.

² TOHOKU IMPERIAL UNIVERSITY, COLLEGE OF AGRICULTURE. AMERICAN INFLUENCE UPON THE AGRICULTURE OF HOKKAIDO, JAPAN. Sapporo, Japan, 1915, pp. 1-21.

³ Letter dated Tokyo, July 18, 1928.

⁴ Letter dated Aomori, Japan, Dec. 7, 1927.

and the remainder made up mostly of Ben Davis, Smith Cider, Red Astrachan,⁵ Oldenburg (L. . . .). The latter is a favorite variety and . . . from the middle of August to the first of September. . . . of this variety remained in obscurity for more than 50 years, the name having been lost soon after its introduction. . . . the fall of 1924 Prof. Y. Hoshino, of the Hokkaido Imperial University at Sapporo, under whom Mr. Susa studied, when visiting the department orchard at the Arlington Experiment Farm near Washington, D. C., saw the Summer Pearmain growing there and from the striking resemblance of the tree to the one in question in northern Japan, together with such other evidence concerning the fruit as he was able to obtain, he was convinced beyond any doubt that it was that variety. This view was confirmed also by Mr. Susa during his visit later to this department.

In Japan the Ralls is outstanding for its keeping quality. Mr. Dun writing from Tokyo on July 18, 1928, stated that it was still in the market in Tokyo at that time. He also stated that 30 or 40 years ago the Baldwin, Rhode Island Greening, Yellow Newtown, and Winesap were frequently seen there, but that they have disappeared from the markets.

How long these American varieties will maintain their relative importance in the apple industry in Japan is problematic. The temperature conditions in the Aomori district and in Hokkaido are much the same as in New York, and the rainfall is comparable with that in the District of Columbia. Varieties that do well in New York and southward to the Potomac River are likely to prove adapted to the more favorable apple-producing sections in the northern part of Japan and in Hokkaido. On the other hand, the experiment station at Aomori is located in the leading apple district of the country and a well-trained horticulturist is in charge. A very natural ultimate consequence would be the development by breeding of varieties peculiarly suited to the local needs of the industry and to the tastes of the people. Such a development has been going on in our own country for many years.

H. P. GOULD,
Senior Pomologist, Bureau of Plant Industry.

ASIATIC Beetles of Three Kinds, Recent Invaders, Are Studied During the summer of 1920 the Asiatic beetle (*Anomala orientalis* Waterhouse) was discovered in a nursery near New Haven, Conn. By 1925 the insect had spread over 27 city blocks, and some damage to sod was apparent. In 1926 the beetle was found near Jericho, Long Island, where it had damaged several acres of turf. About the same time it was found in abundance at Mount Vernon, N. Y., and several other points in Westchester County, N. Y. Since then the Asiatic beetle has been collected at Elizabeth and Rutherford, N. J. The State and city officials, cooperating with the Bureau of Entomology, attempted to eradicate the infestation at New Haven in 1925 and 1926 by treating the turf with carbon-disulphide emulsion. A marked

⁵These varieties not of American origin but widely grown here for a century and in all probability included in the collection that went to Japan in 1871.

reduction in the number of larvæ was obtained. When the Asiatic beetle was found on Long Island and in Westchester County, the eradication program at New Haven was discontinued and efforts were devoted to a study of the distribution, life history, and habits of the insect, and of means for its control.

Life History and Habits of the Asiatic Beetle

The Asiatic beetle is somewhat smaller than the Japanese beetle (*Popillia japonica* Newman), and varies in color from black to a brownish gray. On many individuals the wing covers are marked by more or less irregular, transverse, brown or black lines. The life history of the Asiatic beetle is similar to that of the Japanese beetle. The adult beetles appear early in July and are present for four or five weeks. Unlike the Japanese beetle, they are not strong fliers; in fact, many of



FIGURE 1.—Small area of lawn left untreated, showing turf entirely destroyed by the grubs of the Asiatic beetle

the adults never fly at all. Under favorable weather conditions some flight occurs, but usually at not more than 2 or 3 feet above the ground. Some feeding by the adults has been observed on the blossoms of roses and hollyhocks. Studies of the insect in Hawaii indicate that in those islands little or no feeding takes place during the adult stage. After mating, the female deposits between 40 and 60 eggs in the soil, in a manner similar to that of the Japanese beetle. Upon hatching, the larvæ feed on the roots of grasses and other shallow-rooted plants. They become full grown by the middle of October and pass the winter in the soil at depths ranging from 6 to 15 inches below the surface. In the spring they approach the surface and feed for about a month or six weeks before transforming into pupæ.

The damage caused by this insect is done almost entirely by the larvæ, or grubs, and the injury to sod is similar to that caused by the larvæ of the Japanese beetle. (Fig. 1.) Asiatic beetle larvæ feed somewhat closer to the surface than Japanese beetle larvæ, and, when they occur more abundantly than 75 or 100 to the square yard, they

may destroy the sod. The natural spread of the insect is relatively slow, as is evidenced by the infestation in New Haven, which has been present for at least eight years, but probably does not extend over more than 3 or 4 square miles, whereas infestation by the Japanese beetle extended over an area of 5,122 square miles in 1924, eight years after its discovery in New Jersey.

The application of lead arsenate to the soil as a means of control for the Japanese beetle led to the use of this insecticide against the Asiatic beetle. Treatments have been applied on most of the estates on Long Island where injury to turf has occurred, and the results have been excellent. The application of lead arsenate, either at the time the lawn is reseeded or as a top-dressing in cases where injury is slight, is a cheap and practical method, and, thus far, has afforded excellent protection to the turf. Detailed instructions for the treatment of lawns are given in another article in the Yearbook entitled "Lawns Protected by Lead Arsenate From Beetle—Grub Injury."

The Asiatic Garden Beetle

In July, 1926, a beetle was sent for identification to the Japanese beetle laboratory by a lady in Mount Vernon, N. Y., who thought it might possibly be the Japanese beetle. Investigation proved that it was identical with an insect which had caused damage in Westchester County, N. Y., in 1922, and in Essex County, N. J., as early as 1921. Owing to the similarity of this to a native species (*Serica parallela* Csy.), the correct identification of the insect had not been made in 1921 and 1922. It was later positively identified as the Asiatic garden beetle (*Aserica castanea* Arrow), an insect heretofore known to occur only on the islands of Japan. During 1926 several reports of damage by this insect in Westchester County and in northern New Jersey were received by Federal and State officials. In 1927, 1928, and 1929 this insect became increasingly abundant, and it is now known to occur in Connecticut, southern New York (Long Island), central New Jersey, eastern Pennsylvania, and the District of Columbia.

The adult insect is a small, brown beetle, not more than one-half inch long, somewhat more slender and less robust than the Japanese beetle. Fine hairs on the wing covers give it a velvety appearance. It is similar to the Japanese and Asiatic beetles in its general life history. The adults emerge late in June and are present until the early part of August. The eggs are deposited during July in clusters of four or five, from one-half inch to 4 inches below the surface of the soil.

The adult beetles fly in the evening, and, to a slight extent, in the early hours of the morning. During the day they remain hidden beneath the grass, or an inch or two below the surface of the soil. They feed almost entirely between 8 and 11 p. m. They are strongly attracted to lights, and have been collected from the outside of window screens and on screen doors when the houses were lighted at night. The young larvæ feed very close to the surface of the soil. They become full grown late in the fall, and pass the winter from 7 to 12 inches under ground. The larvæ do not become active as early in the spring as the larvæ of the Japanese and Asiatic beetles, and it is not until the latter part of April or early May that feeding is resumed. This insect breeds as readily in meadow lands as in well-kept lawns or golf courses, thereby differing from the Asiatic beetle. While severe

injury to turf by larvæ of the Asiatic garden beetle has been observed, this insect is not generally considered to be primarily a pest of turf.

The adult Asiatic garden beetle has been recorded as feeding on more than 50 species of plants. Among the strictly economic plants which it attacks are beans, carrots, peaches, and peppers, as well as pine, hemlock, barberry, rose, yew, aster, lilac, and dahlia. The adult of this beetle differs from the adult of the Japanese beetle in the manner of feeding, in that it eats the entire leaf, except the main ribs, whereas the Japanese beetle eats out only the softer portions of the plant tissues between the veins. (Fig. 2.)

Experience has shown that treatment with lead arsenate is as effective in destroying the larvæ of the Asiatic garden beetle in the soil as it is in the case of the Japanese and Asiatic beetles. Spraying the food plants with 3 pounds of powdered lead arsenate in 50 gallons of water is effective where the number



FIGURE 2.—Characteristic injury to peach leaves caused by the Asiatic garden beetle

of insects present is not too great. Trap lights placed over large funnels have also proved effective. (Fig. 3.) In one instance as many as 157,774 adults were captured in one trap during a period of 30 days.

The Japanese Serica

The Japanese serica (*Serica similis* Lewis) was collected in very small numbers on Long Island during 1927, 1928, and 1929. It closely resembles the Asiatic garden beetle in appearance and habits. It is known to occur in Japan and has been reported as causing some injury to sugar beets in that country. Thus far it appears to

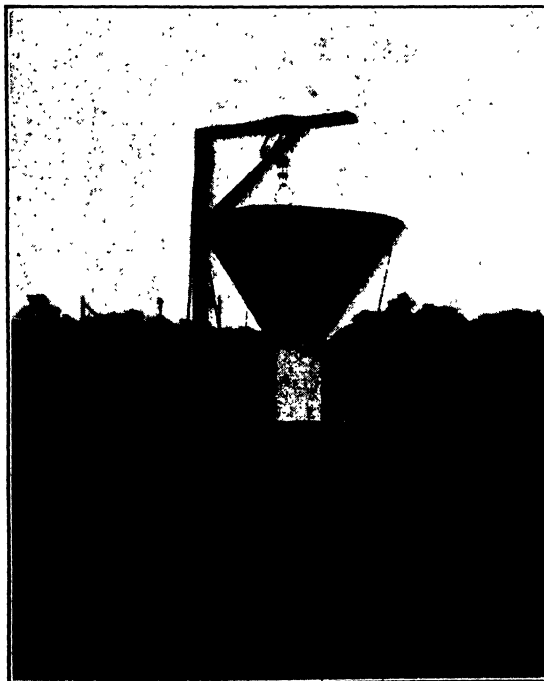


FIGURE 3.—Light trap used in capturing adult Asiatic garden beetles

be sparsely distributed in Nassau and Queens Counties on Long Island, but it is evidently becoming more numerous in that district. The adults appear somewhat earlier in the season than those of the oriental garden beetle and disappear earlier in the summer. Beyond this, little is yet known concerning the life history and habits of this insect.

LOREN B. SMITH,
Principal Entomologist, Bureau of Entomology.

BAMBOOS Valuable for Ornamental Use When Properly Situated

Bamboos are true grasses, just as are corn, wheat, oats, and a host of our important crop plants, but they do not belong among such grasses as those that are valued chiefly for their seeds, nor do they take a place among the grasses that are valued for their leaves, the forage and turf-producing plants. Economically they are valued for their timber,

which seems more or less of a paradox to the northerners whose grasses are more lowly affairs.

It is not so much in the timber bamboos that our present interest is centered, for the timber bamboos, perhaps, are the least suited for home adornment.

The bamboos are essentially tropical and reach their greatest development and distribution within that zone. In the Orient, however, they extend northward from India, Ceylon, and Java, into



FIGURE 4.—Small grove of bamboo used with other ornamentals

China and still farther through the Philippines and Formosa into Japan. For gardens in the United States, particularly those of the South Atlantic, the Gulf Coast, and the Pacific Coast States, we must turn to the northern species for our bamboos, not only because they are hardier, but because they are of a size more in scale with the plants used about the home.

Among them there is a great diversity of size and style, but there are two characteristic habits which need be considered. In general terms, all bamboos may be divided into those that form dense clumps with many canes rising from a crown that slowly increases in diameter from year to year and those that spread freely by underground running rootstocks until thickets or groves are formed. By the wise gardener this latter group must be viewed with suspicion, unless he has a special place to use them, in which he can make allowance for their spreading habit, for, as any gardener knows, the plant that will not stay where it is planted and invades all adjacent territory is a nuisance, no matter how beautiful it may be in itself.

Vary Much in Size

In size the bamboos vary from dwarf, twiggy plants, scarcely larger than some of our native panicums, to strong-growing plants with canes even 100 feet high. The former have low, slightly branched shoots with leaf blades of varying sizes from the slender, grassy *Sasa pumila* to the broad, almost palmlike *Bambusa palmata* or *S. veitchi*, while the latter make strong shoots often 8 to 12 inches in diameter with spreading branches and slender leaves which last several years before falling.

For the gardener who is interested in effects, the bamboos are of great value because their habit of growth is essentially different from that of our native woody plants, with the result that they make a conspicuous and exotic contrast with our own broad-leaved trees and shrubs. There is a quality which, for want of a better word, may be called tropical in their aspect which the gardener can employ with striking effect wherever they are hardy, and as they are evergreen this contrast may be obtained not only with deciduous plants but with conifers and broad-leaved evergreens.

Throughout the South the clump bamboos may be used in garden design as accents, in mixed borders to supply the vigorous vertical note that is obtained from Lombardy poplars and red

cedars in the North, or they may be paired to mark a vista or a passage way, taking care that they are given adequate room for development and desirable neighbors for contrast. On the other hand, the bamboos that spread by underground stems must be planted in groves if they are tall, as is the timber bamboo, or as ground covers, as is the case with *Sasa pumila* or the larger *S. veitchi*. The peculiar and characteristic beauty of a grove of timber bamboo can not be overestimated, but for it space is required, and often the home owner does not have this. There is nothing more lamentable than the use of this plant where clump bamboos should have been employed, not only because the plants can not thrive and the best effect can not be secured, but because the plants will constitute a perennial nuisance from their suckering.



FIGURE 5. A clump bamboo used in formal planting

Running Bamboos Kill Herbaceous Plants

Grounds covered with the dwarf running bamboos are often very beautiful, but here again the gardener must be cautioned, as these spreading species permit few associates and in time actually kill out herbaceous plants which share the space.

In using bamboos the planter should remember that they prefer a deep, moist but not sodden, fertile soil. If this is not provided, the plants never reach their maximum growth, with the result that the shoots are small and the leaf blades show a starved, yellow-green color. The dwarf running bamboos are often useful as ground covers in open woods if these are not too dry, and often show better color and leaf development than in the open. The shade from the trees serves as well as a slight protection from the sun scorching in the winter, along the northern limits of their range of hardiness. He should remember also that the plants must be given several years to become established in a new site and must be given care, especially in watering, until they show that they are established. As to how far north these plants may be used, there is, as yet, little evidence, but one should remember that many which are frozen to the ground and spring up again, though hardy in one sense, never show their full and perfect beauty.

B. T. GALLOWAY,
Principal Pathologist, Bureau of Plant Industry.

BARLEY Scab Effectively Controlled by Rotations and Clean Fall Plowing Barley has been severely attacked by scab in the central and eastern United States, and these losses always have been associated with fields where cornstalks have been left on the surface of the ground. General epidemics of this disease have occurred through the corn-winter-wheat area in 1890, 1909, 1919, 1928, and again in 1929. In 1928 scab was severe on wheat and barley alike in this area. Because barley acreage had been greatly increased in the Ohio Valley States to replace winter-killed wheat, a serious problem presented itself. Farmers and feeders alike found that scabbed barley was not suitable for feeding pigs and, unlike wheat, the scabbed kernels could not be removed by cleaning. The epidemic of barley scab of 1929 exhibited less general severity, but caused somewhat similar difficulties in feeding the scabbed barley to pigs.

Barley Scab Can Be Controlled

Damage from barley scab has been associated with cornstalks, wheat straw, and similar crop residues left on the surface of the fields or only partly turned under. For example, in 1928 scab infection averaged 17 per cent in 52 barley fields in northern Illinois and southern Wisconsin where barley was sown in disked or poorly plowed cornland with stalks left on the surface of the ground. This resulted in grain that pigs would not eat. In contrast, the infection in 102 fields in this area where corn was removed and the land well plowed was less than 2 per cent, with little damage to the feeding value of the barley.

The scab parasite lives over winter on old cornstalks and other crop residues. When the weather is humid and hot it spreads to the developing barley kernels and causes the scab disease, resulting in lightweight barley of poor quality. The scab infection spreads through the kernel and into adjacent kernels of the head during ripening and even after the grain is cut, if grain is harvested at all green or if protracted rainy weather follows cutting. Fields showing scab infection should be allowed to become fully ripe and dry before cutting in order to prevent spread of the infection in the bundle and shock. Crop rotation, clean fall plowing, and a general clean-up of cornstalks will control barley scab. Up to this time no scab-resistant variety of barley has been found or developed, although several varieties of wheat have been found to be scab resistant, notably selections of Illinois No. 1, Progress, Resaca, and Norka. These results and some progress made with barley indicate that scab-resistant varieties can be produced.

Feeding Scabbed Barley

Probably the best means of disposing of crops of scabbed barley is by feeding them to beef or dairy cattle or to sheep. Feeding experiments by the animal husbandry departments of the Illinois and Wisconsin Agricultural Experiment Stations, as well as general farm experience, have shown that the feeding of badly scabbed barley to beef cattle results in good gains in weight. Satisfactory milk production has been obtained at the Wisconsin station when barley containing 70 per cent of scabbed kernels was fed in grain mixtures containing 70 per cent by weight of this barley. Lambs have made good gains in weight on this same heavily scabbed barley when it was used as the only grain in fattening rations.

The badly scabbed barley was not satisfactory for pig feed. When 60 per cent of badly scabbed barley was used in a dry-lot feeding mixture the pigs vomited when started on the feed and afterwards did not eat enough to maintain their live weight. The percentage of scabbed grain as well as the severity of infection and the stage of kernel development when scab infection occurred all influenced the value of the barley as a feed for pigs. The pigs were very sensitive to mixtures of badly scabbed barley with clean grain. Frequently less than 30 per cent of badly scabbed barley in clean barley, oats, or corn resulted in reduced feed consumption and little or no gain in weight.

Barley a Profitable Small Grain for Feed

In some sections of the United States barley has been found to be the most profitable small grain the livestock farmer can grow for feed. Therefore, the production of clean barley for feed purposes on the farm has an important bearing on farm profits. Proper rotation and fall plowing for barley will insure this feed production on the farm even in areas where the economy of such a practice in the growing of a cash grain crop is questionable. Scabbed barley should be fed to cattle or sheep on the farms rather than sold at a big discount at the elevator. However, it is best to prevent the severe occurrence of scab by following proper cropping practices.

JAMES G. DICKSON,

Agent, Barley-Scab Investigations, Bureau of Plant Industry.

BEE Races Vary in Physical Characters and in Behavior

The honeybee (*Apis mellifica* L.) is not native in the United States but was introduced from Europe in the first half of the seventeenth century. In the last three-quarters of a century it has been an object of intensive study and during this time certain varieties or races have become recognized. For the beekeeper in the United States the most important of these are the Italian, *Apis mellifica ligustica*; the Caucasian, *A. mellifica remipes*; the Carniolan, *A. mellifica carnica*; the ordinary black, or Dutch bee, *A. mellifica lehzeni*; the Cyprian, *A. mellifica cypria*; and the German brown, *A. mellifica mellifica*.

Little is known, as the result of any scientific work, as to the biological differences of these races, and it would even be hard for the ordinary observer, on first glance at least, to distinguish between them by the eye except on the basis of color, and, in the case of the Cyprian, on size. The Italian and the Cyprian are readily distinguished from the other races by having yellow or russet-orange bands on the first three or more abdominal segments. The Cyprian has often been described as being a light-colored bee, but the yellow coloring of the first two abdominal segments, at least, approaches a russet orange. The Cyprian worker bee, regardless of color, is readily distinguished from the Italian by its smaller size. In the United States a "golden" Italian has been developed, an Italian bee with a pronounced area of yellow coloration on at least five abdominal segments. It should be noted that certain bees from the Caucasus show yellow on the first two or three abdominal segments, but these are to be distinguished from the typical gray Caucasians.

The typical gray Caucasian, Carniolan, Dutch, and German brown bees are known as "dark bees," because their general appearance is dark brown or black, or both. In the case of the Carniolan and Caucasian, however, the abdominal segments are marked by a band of gray or grayish-yellow hairs. In the newly emerged Carniolan bee this gives a zebra-like effect. It might prove a little difficult to distinguish visually between young Carniolans and young Caucasians. Newly emerged German brown bees also have bands of grayish or grayish-yellow hairs on the abdomen but the bands are narrower and the hairs are less dense. In addition the segments may present a slightly sooty appearance to the naked eye. There seems little difference, on casual observation at least, between Dutch and German brown bees.

Tongue Length Varies

Recently intensive biometric studies of the honeybee have been undertaken, more especially in Russia, to determine differences between various races and strains. It has been found in Russia, a country in which there has been relatively little interregional shipment up to the present, that the tongue length decreases from south to north, in other words, from regions with less intense to those of more intense honey flows. Furthermore, according to measurements in Russia and in the United States, the Caucasian bee has the longest tongue, while the Cyprian comes next. After this comes the Italian.

The question of tongue length is now to the fore in various parts of the world in connection with the need of pollinizers for red clover. The corolla tubes of red clover are considered too long for the shorter tongued honeybees to gather nectar from them. Hence the visits of

all but the longest tongued bees are greatly reduced. The honeybee most common throughout the United States, the Italian, is not the longest tongued bee. The ordinary black or Dutch bee, common in certain localities, is also short tongued.

A few biological differences have been noted as the results of observations in commercial apiaries. One of these has to do with rearing brood in season and out of season. It is often stated that some one race restricts its brood rearing quicker in time of dearth or famine than any other race. Studies in the bee culture laboratory of the Bureau of Entomology at Somerset, Md., on the Carniolan, Italian, and Cyprian races, indicate that there all three give the same

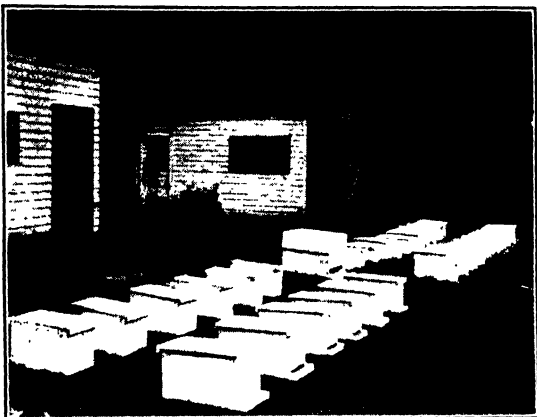


FIGURE 6.—A few of the nuclei used in queen rearing at the bee culture laboratory of the Bureau of Entomology, where a study of races is being made

relative response to seasonal honey flows and pollen yields. (Fig. 6.)

Cyprian Bee the Least Gentle

The Cyprian, in the writer's experience, is the least gentle, followed by the Dutch and German brown. The Caucasian is reputed to be the most gentle, and the Carniolan a little more gentle than the Italian. The response of the Cyprians to smoke is well described by Dadant, who likens it to the sound of "meat in the frying-pan." When Cyprians are aroused they seem unsatisfied until they have accomplished their purpose, stinging. Once on the beekeeper, they will cling to him even in a dark building until their purpose is accomplished. Although active workers, their bad temper seems to preclude their use in commercial apiaries where quick movements must be made. Another disadvantage of the Cyprian bee, for comb-honey production at least, is the fact that cappings of their honey leave little or no air space between honey and capping, thus keeping the latter from having a white appearance. The Italian is not such an offender in this respect, while the black races cap their honey white.

In this country the Italian bee has the reputation for keeping its hive cleaner and for fighting European foul brood better than the darker races. It also, in the writer's experience, puts up a better fight against the wax moth than do the Carniolan, German brown, or Dutch races. The Cyprian also fights the moth, as well as robber bees. The Caucasian is said to defend its hive well. One disadvantage of the Caucasian, however, is its abundant use of propolis or "bee glue." At times it will even greatly restrict the opening of the hive with propolis. A fault of the German brown and Dutch bees is their tendency to "run" off the frame during manipulations. One biological characteristic which is said to distinguish the German brown from the Dutch bee is the pronounced tendency of the Dutch bee to swarm.

On the whole, until more scientific data on the biological and physical differences of various races are available, the Italian bee seems to satisfy most of the needs of the American beekeeper. The common black bees of this country, the descendants of the first bees imported, appear to be of Dutch stock. The Italian and the other races were not imported into this country until over two centuries later.

W. J. NOLAN,
Apiculturist, Bureau of Entomology.

BEEKEEPING Studies in Intermountain States Show Cost Variations Years of low prices or of low yields of honey may not greatly affect the welfare of the smaller beekeeper who combines honey producing with some other work which enables him to use profitably such time as he need not devote to the bees, but for the specialized beekeeper, who usually has no source of income except his bees, low prices or low yields mean reduced income.

The lower honey prices in recent years have stimulated the development of cooperative selling agencies, and these give much promise of bettering the situation of the honey producer. Many honey producers have developed local markets, which seem to be a ready means of increasing profits. Other producers are considering methods of reducing production costs as one means of increasing net returns from their apiaries.

Recent work done by the bee culture laboratory of the Bureau of Entomology in cooperation with the Bureau of Agricultural Economics indicates the possibilities of reducing the cost of producing honey through improvement in apiary management. These studies were begun in the Intermountain States, with the bee-culture field station at Laramie, Wyo., as a base, and will be undertaken next in the white-clover region (the North Central and Lake States), which is another large honey-producing region; they will be continued until full data have been obtained under various typical conditions. This work is done by securing the cooperation of representative honey producers using good methods. They keep daily labor records, expense accounts, etc., giving a complete record of their costs of production. These records are studied in connection with the methods of management used in individual businesses, and the records are compared.

Profit Linked With Size of Business

While efforts to reduce the cost of producing honey should lead to greater profits, it must be remembered that the lowest possible cost per pound does not necessarily result in the greatest profit for the operator. Profit is also linked with the size of the business and the total production of honey. Assuming that the large operator sells his honey for the same price per pound as the one with a small business, the large producer could permit higher costs and still have a larger income. For example, an efficient small producer having a cost of 4 cents per pound for 30,000 pounds of honey selling at 7 cents a pound would have a return of \$900 net, whereas a producer of 120,000 pounds having a cost of 5 cents per pound, and selling at the same price, would have \$2,400 net return. Income may sometimes be increased

through larger operations even though the same degree of care can not be given to the larger business. On the other hand, there seem to be situations where it would be well for the small producer to keep his costs low and devote his spare time to some other work which might yield him a good profit in years when the honey flow gave him little or no income.

Those who kept records in the Intermountain States obtained yields of extracted honey ranging from 30 to over 200 pounds per colony. The yields of comb honey ranged from 1 to 7 cases per colony, with only four operators securing more than 3 cases per colony.

It should be emphasized that comb honey ought to be produced only in regions particularly adapted to the production of fine comb honey; that is, regions where there is a regular, abundant, and rapid flow of white honey and where there is a minimum of off-color honey and of propolis. In all other regions it is more profitable to produce extracted honey unless a local market can be developed for the dark comb honey. In many cases this can be done, as a local dark honey is often salable in the locality where it is produced, and may even be preferred to a white honey from some other region.

It has been shown that, with not more than 250 colonies, a man may have time to carry on outside enterprises. Except for brief periods in summer, some other occupation not too exacting in its demand for labor at a particular time could be carried on along with the care of 250 colonies of bees. Efforts will be made to determine what other work will most profitably fill up such time as the beekeeper may have to spare. With 500 to 600 colonies of bees, the time of one man was used for most of the year, with additional labor throughout the summer. A few apiary systems of this size were cared for by one man, but this requires excellent organization of the business so that as much work as possible can be done during the winter, leaving only the actual handling of the bees to be done during the busy summer season.

On the more than 25,000 colonies of bees under consideration, the total cost of handling bees throughout the season ranged from \$12.50 per colony down to \$2.04 among the different operators. At 50 cents an hour, the highest labor cost was \$4.47 per colony and the lowest \$1.09, while charges other than labor ranged from \$9.65 to \$0.47 a colony. The investment in bees and equipment ranged from \$12 to \$45 per colony. Future studies should indicate the significant factors responsible for such variations in costs.

Average Net Incomes of Operators

The average net income for all operators was about \$3,000, with their apiaries ranging in size from 160 to 1,800 colonies, some of the

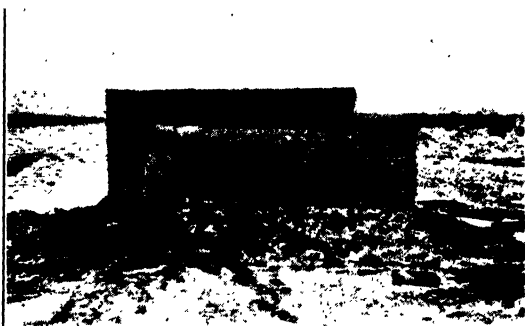


FIGURE 7.—A form of winter case made of galvanized iron and holding twelve 2-story colonies, which is used in some sections of the Intermountain States in preference to cellar wintering

largest net incomes being in excess of \$16,000. The average number of colonies in an apiary business was about 650, making the net income per colony average about \$4.65. These figures include labor of operator at 50 cents per hour and interest at 6 per cent on the investment, and are based on a price of 6¼ cents a pound for honey and 27 cents for beeswax.

Returns for labor and management for each hour of labor performed by the operator, after allowing 6 per cent interest on the investment, ranged from a profit of \$11.78 down to a loss of \$1.61 per hour. The net income per colony ran as high as \$16, though 4 operators out of 39 showed a loss on the operations of the season.

Where yields of 90 pounds or more of honey per colony were obtained, the results were generally favorable, while for yields of less than 60 pounds the returns were likely to be unfavorable.

The costs for producing extracted honey averaged 7 cents per pound for all apiaries with less than 400 colonies; 7.4 cents for all apiaries having 400 to 800 colonies; 7.2 cents for apiaries having 800 to 1,200 colonies; and 5.4 cents for apiaries with more than 1,200 colonies. This



FIGURE 8.—Straw and tar-paper packing as used for wintering protection of bees in some sections of the Intermountain States

would seem to indicate that the larger apiaries could be managed more economically than the smaller units. This is not necessarily the case; indeed, in several units of less than 400 colonies, the cost was lower than the 5.4 cents per pound of the units of over 1,200 colonies. The facts seem to be that few beekeepers, unless they are able to keep their

costs low, ever increase their apiary holdings to any great extent—the large operators, with few exceptions, being very capable honey producers.

For individual producers, the cost per pound ranged from 2 to 22 cents. Good yields of honey are most often accompanied by low costs, whereas low yields are usually accompanied by high costs, though other factors than yield must, of course, be considered. Some producers with low yields of honey have unusually low costs because of economical use of labor, supplies, or equipment. Others with good yields have high costs.

Faults of Management

Low yields, though usually due to seasonal conditions over which the operator has no control, were sometimes due to faults in management, among which disease and poor wintering were common causes. (Figs. 7 and 8.) Winter losses of bees appeared to be due, in some cases, to poor preparation for winter, including quality of bees and quality of stores, resulting in great loss of bees after flying began in the spring. Apiaries were visited in which, owing to these causes, egg laying had ceased, brood was being dragged from the hives, and some colonies had died. Many other causes tend to lessen the yield of honey.

The records of this work for only one season are necessarily so incomplete that it is often impossible to determine what percentage of the favorable results was due to management and what percentage was due to seasonal variations. Recommendations, therefore, of specific methods of management, of size and arrangement of honey houses, and of kind and amount of equipment will not be given at this time. After further records have been secured, it is planned to recommend, for apiaries of various sizes, a system of management and a minimum of equipment which can be expected to give good results.

E. L. SECHRIST,
Associate Apiculturist, Bureau of Entomology.

BIBLIOGRAPHIES Give There comes a time to most persons. Farmer Short Cut to when it is realized that many mistakes could be avoided and much Practical Information faster progress made in the matter of making a living if one could profit more directly from the experience of others. If this realization comes to a farm woman whose source of money income is confined to poultry raising she begins to wonder whether she is following the most approved practices or whether she could make more money from raising ducks than she now does from chickens; or, if she is already raising ducks, she wonders whether her market outlet for them may not be improved.

Probably the first thing she does is to talk the matter over with her family who, she may find, knows even less about it than she does. Then maybe she goes to the county agent and asks him for advice. Perhaps he has been devoting a large part of his time to improving the quality of the livestock of the neighborhood, so feels the need of brushing up on the poultry question. He tells her that he will look into the matter and let her know what he finds. He does so, and in the course of his investigation finds that a bibliography has been made in the library of the Bureau of Agricultural Economics on the Economic Aspects of the Poultry Industry (Agricultural Economics Bibliography No. 24). This lists the most important writings on the subject, from 1920 to 1927, and gives a short description of the contents of each publication. It has an index, so the material on ducks, geese, capons, turkeys, and other fowls may be quickly found.

This leads the county agent to a farmers' bulletin on duck raising as well as to books and other material on the subject of poultry raising in general. These supply all the information the farm woman needs and enable her to decide whether any of her practices should be changed or whether in her locality chickens are more profitable than ducks. She has the satisfaction of knowing that she has had the advice of specialists and that her action is based on the experience of those who have made a success of both lines of the industry.

When the Farmer Decides to Move

Suppose a farmer has decided to sell his farm in the South and move to New York State for personal reasons. It is of the greatest importance that he should make wise decisions as to the type of farm he buys in the new locality and the kind of farming enterprise he undertakes. He knows that he must be prepared for a short supply of farm

labor, and he would like to know how one crop compares with another as to the number of hours of man and horse labor required for different crops. He has seen a notice of a bibliography issued by the library of the Bureau of Agricultural Economics with the title "Labor Requirements of Farm Products" (Agricultural Economics Bibliography No. 26), so he writes for a copy. He finds in it references to bulletins and other publications that give the hours of labor required for most of the crops produced in New York State, including apples. He has been thinking of an apple farm because, as he has raised peaches in the South, he is accustomed to fruit. So he sends for these bulletins and studies them carefully.

Before making a decision, however, other things must be considered. What part of New York State grows the best apples at the least cost? If this could be decided on the basis of the facts, what about a market? Are enough apples raised in that section to supply the needs of the market adequately or is there a demand for more?

These questions lead him to feel that he must study the economic aspects of the whole industry of apple raising. To his satisfaction he finds that there is also a bibliography covering this subject entitled "Economic Aspects of the Apple Industry" (Agricultural Economics Bibliography No. 19). He sends for a copy and spends much time during the winter months studying the literature to which it leads him, so that when spring comes he knows just what he wants and why, and is ready to go after it with confidence.

A list of the bibliographies that have been issued in the series called "Agricultural Economics Bibliography" may be had upon request. Among timely recent additions to it are *Taxation and the Farmer* (Agricultural Economics Bibliography No. 25) and *Agricultural Relief* (Agricultural Economics Bibliography No. 27).

MARY G. LACY,

In Charge, Library, Bureau of Agricultural Economics.

BIG Game Increase in Southwest Forests Calls for Control Measures

The elk herds in the Southwest have been established by plants of stock mostly, if not entirely, from the North Yellowstone herd in northern Wyoming and southern Montana. On the national forests there are four elk herds on open range and one small herd under fence. The largest herd, the Sitgreaves herd, established by a plant of about 60 head in 1914, contains more than 1,000 head, not counting the 1929 calf crop. About 900 head are on the Sitgreaves National Forest, about 60 have drifted to the Coconino National Forest, 25 or 30 to the Tonto, and a few to the Tusayan. The herd is increasing so rapidly that early action for controlling its numbers will probably be necessary to prevent the elk from overcrowding the range, spreading to ranch and settlement areas, damaging crops, and becoming a nuisance.

An elk herd on the Santa Fe National Forest near the waters of the Pecos River has increased from about 18 head, planted in 1915, to 200 head, not including the 1929 increase. During the last three or four years the increase has been rapid and the herd is extending the territory over which it grazes. Its number will probably need to be kept at 600 head or less to prevent overstocking of the range and winter migra-

tion to settlements and farms. During February, 1927, 23 head were planted in the Blue Range country on the Apache National Forest and are reported to be doing well there. The small herd that is kept under fence is on the G O S cattle range of the Gila National Forest. About 25 elk were introduced there in 1926 and the herd had increased to more than 40 head by the fall of 1928.

In February of 1927, the Arizona game department shipped in two carloads of elk. One carload was placed on the Hualapai Mountains near Kingman, Ariz., remote from any national forest. The elk in the other car were released between the two divisions of the Tusayan National Forest, and it is thought that about 25 head of these are now grazing on the Tusayan and Coconino National Forests.

Antelope Represented in 11 Southwest Forests

Although the antelope is an easy prey to hunters, it was never exterminated in the Southwest and at present is represented on 11 of our 14 national forests in the region. Some of the herds graze on and off the forests and several bands graze entirely outside national-forest boundaries. In 1926 it was reported that there were about 3,000 antelope in New Mexico, in about 40 bands. Some of the ranges, such as the Haylake country on the Coconino National Forest in Arizona and the V Cross T range in New Mexico, are thought to be carrying about their full number of antelope, although it is reported that this animal is migrating in a few instances to new areas or at least increasing its immediate range. The antelope seems to have responded to the protection given by closed seasons for a number of years. The records of the Forest Service show that during the 3-year period from 1925 to 1928 antelope on the national forests of the Southwest increased about 36 per cent. It may be that some action will have to be taken to control the numbers on local areas. Some game authorities believe that it would be advisable to reduce the number of bucks in some of the herds, which would effect some control of total numbers.

The Mexican bighorn mountain sheep occurs on a few areas within the desert mountain ranges of southern New Mexico and southern Arizona. In Arizona the Coronado National Forest reports 230 mountain sheep and the Tonto 27. The Lincoln National Forest reports 175 on the Guadalupe Mountains of southeastern New Mexico. Some mountain sheep still exist outside the forests, especially in the Big Hatchet Mountains in southwestern New Mexico, a remnant in the San Andres, and a few head on the Papago Indian Reservation in south-central Arizona. All but one of the mountain-sheep areas are within State game refuges.

Three species of deer are found in the region. The mule deer ranges over at least one-fifth of the area of New Mexico and almost as much of Arizona. The whitetail deer is common throughout both States and often its range overlaps that of the mule deer. In the southern parts of the region, a small deer known as the Arizona whitetail, the Sonoran deer, the Chihuahuah deer, and the Rock deer, occurs but not in large numbers.

Mule Deer and Whitetail Deer

It is difficult to determine the numbers of mule deer and whitetail deer. Possibly the censuses on the national forests for the period from 1925 to 1928 indicate the trend. It is believed, however, that some

of the apparent increase, amounting to about 51 per cent in Arizona and 143 per cent in New Mexico, reflects more detailed and more accurate estimates. It is known that the increase in both species has been very rapid on local areas. On the other hand, there are wide expanses of good deer range that are understocked and on which the numbers do not seem to be increasing, or possibly not even holding their own. For example, the mule deer have become very scarce in southern Arizona, whereas on the Gila National Forest in New Mexico the same species has so greatly increased in numbers as seriously to overstock its range. In the Mount Graham and Catalina Mountains of Arizona the whitetail deer has increased beyond the sustained carrying capacity of its range. The causes of the increase include the establishment and maintenance of refuges, the killing of many of the lions and other animals that prey on deer, and better law enforcement, which has reduced the annual kill by man to approximately 6 per cent of the total numbers. This kill is far under the natural increase. On the Gila concentration area, relief is being sought through opening the game refuges, abandoning the killing of lions, and making the area more accessible to hunters by the building of a motorway. Relief is being sought on the Mount Graham and Catalina areas, which have been game refuges for several years, through opening the bulk of them to hunting.

The grizzly and black bear, both now recognized as game animals by the laws of New Mexico and Arizona, have been greatly reduced in numbers. Only 24 grizzly bear are reported on the national forests of the two States. The brown, or cinnamon bear, found throughout the region, is said, by authorities, to be merely a color phase of the black bear. The State game laws protect the bear excepting during a month's open season with a bag limit of one but provide for the destruction of bear that are known to be killers of domestic livestock.

The collared peccary is the only species of wild pig occurring in the United States. It is found in the southern portions of both New Mexico and Arizona. It is not a very valuable game animal although it has been hunted for its meat and also as a trophy. It is known also as the musk hog or the javelina. A few peccaries occur in the extreme southwestern part of New Mexico and a remnant in the sand country east of Carlsbad with about 1,500 reported on the Coronado, Crook, and Tonto National Forests of southern Arizona.

Game-Management Plans Necessary

The increase in big game, which is generally rapid in the Southwest, calls for the application of game-management plans not only for the protection and propagation of the animals but also for the control of their numbers. More information is needed as a foundation for such plans. Information is needed particularly about the relation between the grazing of domestic livestock and the grazing of game. The ranges used by the game animals, except the mountain sheep, are generally suitable to and actually used by sheep, cattle, horses, or goats.

Both New Mexico and Arizona have up-to-date game laws, Arizona having adopted new laws at the last session of the legislature. Under the old laws in Arizona, game refuges could be established, changed, or abandoned only by an act of the State legislature. On January 1, 1929, there were 7 State game refuges covering 1,491,000 acres on the national forests in Arizona. These refuges were large and so few in

number as to preclude a desirable distribution over the State. On the other hand, New Mexico with the power in the State game commission of establishing, changing, or abandoning refuges, had on January 1, 1929, 59 refuges on the national forests with a total area of 2,661,600 acres. Since the enactment of the present game code in Arizona, that State is rapidly changing its refuge system. It is believed that the plan being followed in New Mexico of having a large number of refuges of comparatively small size, well distributed, is bringing about the desired increase in game and at the same time is providing better hunting on the areas immediately around the refuges. A refuge system even of this character, however, must be flexible since deer, especially mule deer, are prone to stay on a range even after it is overstocked and food has become scarce. This may mean that in places provision will have to be made for the opening of areas designated as refuges after a period of closure and the creating of new refuges where local protection of the game animals is needed. This would result in a sort of rotation system under which a former refuge opened to hunting would be closed again after a period of years.

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B LACK Stem Rust of Cereals Has More Than 60 Physiologic Forms The minute fungus, *Puccinia graminis*, that causes black stem rust of small grains and grasses and frequently overwinters on the common barberry, might well be called poker-face *Puccinia* because one can not tell by looking at it how it will act. What appears to be a single rather ordinary rust fungus actually is a large aggregation of parasitic strains that look alike but behave differently.

Black stem rust attacks wheat, oats, barley, rye, and about 100 grasses, both wild and cultivated. It looks just about the same on all of these plants, but it has certain constant peculiarities of structure and form that always distinguish it from other rusts. Whether stem rust be on wheat, oats, timothy, wild barley, quack grass, or any other grass, it always can be recognized as stem rust. But the rust from wheat can not infect oats, that from oats can not infect wheat, and that from rye can not attack either wheat or oats. The appearance of the rust is essentially the same on all three plants, and it therefore is considered a single botanical species. But the species clearly comprises several different parasitic strains (varieties) that look alike but behave differently on cereals and grasses. These parasitic strains are called varieties, because, besides their differences in parasitism, they differ slightly in appearance under the microscope. For convenience they are given Latin names, but the English equivalents are used in this article.

Six varieties of stem rust are known in the United States. The wheat variety attacks wheat, barley, and many grasses, but rye only weakly and oats not at all. The rye variety attacks rye, barley, and many grasses, but not wheat and oats. The oat variety attacks oats and a large number of grasses, but not wheat, barley, or rye. In addition there is a distinct variety on timothy and certain other grasses, one on redtop and closely related grasses, and one on bluegrass and its relatives. None of the last three infects the cereal grains normally.

Inoculations Disclose the Varieties

These varieties are quite distinct, although some of them may infect the same plants. The wheat variety of stem rust and that on rye both thrive on barley. There is no way of knowing by looking at rusted barley whether the rust belongs to the wheat variety or to the rye variety. But it is easy to tell by making inoculations. This is done by taking from rusted barley some of the brick-red dust, consisting of thousands of the spores or reproductive bodies of the rust fungus, and placing it on wheat and rye plants. Under favorable conditions the results will be apparent in about a week. If the rye variety of rust was present on barley, rust will appear on the inoculated rye but not on the wheat. If the wheat variety was present, the wheat will become rusted but the rye will remain almost free.

By making inoculations on certain cereals and grasses in this way it is possible, therefore, to distinguish just as precisely the different varieties of stem rust as it is to distinguish rye from wheat. The rust varieties have specialized in food habits. What is meat for one may be poison for another. The oat variety of stem rust thrives on even a skinny oat plant, but the wheat variety would starve to death on it, no matter how juicy the oat plant might be. Just why, no one knows. And the specialization does not stop with the varieties. There are still more narrowly specialized parasitic races within some of the varieties themselves.

Varieties Comprise Parasitic Races

The wheat, rye, and oat varieties of stem rust all comprise numerous parasitic races, called physiologic forms, that differ in their ability to attack varieties of wheat, rye, and oats, respectively. There are more than 60 of these physiologic forms of the wheat variety of stem rust alone, more than a dozen within the rye variety, and about half a dozen within the oat variety. These forms are designated by numbers only. Because of the outstanding importance of stem rust of wheat, the forms of this variety have been studied most extensively.

Physiologic forms of wheat stem rust differ from one another in their ability to attack certain varieties of wheats. One form may attack Marquis but not Kanred and Kubanka; another, Kanred and Kubanka but not Marquis; another, Marquis and Kubanka but not Kanred; and yet another may attack all three. More than 60 such forms have been recognized by their parasitic effect on 12 varieties of wheat, einkorn, and emmer. The same wheat variety may be very susceptible to some forms, moderately resistant to others, and immune from still others. This explains why a variety of wheat sometimes is very susceptible to rust in one region and resistant in another in the same year, or susceptible in a locality in one year and resistant in the same locality another year, when conditions are favorable for the development of rust throughout. The fact is that there may be different physiologic forms in different regions in the same year and in the same region in different years.

Annual Surveys of Geographic Distribution

Surveys to determine the geographic distribution of physiologic forms of stem rust of wheat and oats are made each year in order to learn not only what is happening in rust development but also what

is likely to happen. For example, the durum wheats were grown for years in the Dakotas and Minnesota without serious injury from stem rust, even in years when bread wheats were severely rusted. But in 1923, 1925, and 1927 many varieties of durum were badly damaged. What is the explanation? Merely this: In most years those physiologic forms that attack the durums severely are not abundant in the spring-wheat area, but they were abundant in 1923, 1925, and 1927. Most durums are likely to be injured by rust in those years when forms to which they are susceptible are abundant and weather is favorable for rust development. Another example: Kanred, a hard red winter wheat, is immune from some forms of wheat stem rust. Therefore it escapes rust injury sometimes and in some places. But it is completely susceptible to other forms. Therefore it is severely injured by rust sometimes and in some places, as in western Nebraska in 1923. Again, Marquis wheat, very susceptible in the spring-wheat area, seldom rusts heavily in the Gulf States and west of the Rocky Mountains, because of the scarcity of those forms that attack it.

Physiologic-form surveys have been used also to aid in determining the spring sources of rust in northern United States. Does most of the rust come from barberry bushes in the North, or is it blown by winds from the far South, where it persists independently of the barberry? In 1926, form 11 of wheat stem rust predominated in the South but was not found in the spring-wheat area. Hence it seems unlikely that the rust migrated from south to north that year. In 1927, on the other hand, the same forms occurred in the South and North, and it appears that the rust may have migrated northward. In 1928, form 38 predominated in Mexico and southern United States, but this form does not infect normally the hard spring wheats nor the durums and, even if it had migrated northward, it could have done but little damage. At the same time, it was found that the wheat rust near barberries in the North was mostly of forms that were very virulent on spring wheats.

Breeding Rust-Resistant Varieties

These facts are important also in breeding rust-resistant varieties of small grains. So far as is known, no variety of wheat is resistant to all physiologic forms. Therefore hybrids are being made in order to combine in one the resistance to as many physiologic forms as possible. The hybrids should be artificially inoculated with all rust forms that occur in the region for which the new varieties are intended. Otherwise their actual value is not known.

All the physiologic forms within each of these three varieties of stem rust probably have not yet been found. Will new forms appear and complicate still further the problem of rust control? They probably will. It is known that in other parts of the world there are forms of the wheat rust and of the oat rust that are more virulent than those hitherto found in this country. They may be introduced, unless they can be excluded by quarantine. And there is evidence that nature is producing new forms by sudden change—mutation—and by hybridization between forms on the common barberry, where the rust develops in the spring and the sexual fusions occur. The eradication of the common barberry will reduce the danger of new and virulent forms being produced by hybridization, and quarantines may reduce

the danger of importing new forms from abroad. In spite of all human effort, new forms undoubtedly will appear to plague us and menace our crops. And then, as now, full knowledge of the situation will be very helpful.

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BLISTER-Rust Control Makes Progress in Protecting White Pine

White-pine blister rust, a fungous disease of foreign origin, is of great economic importance in the eastern United States because it kills the white pine which is one of our most valuable forest trees. White pine is found from Maine to Minnesota and southward to Georgia. It is especially prized because of its rapid growth, excellent timber, high yield, and adaptability to forest management. It also has important scenic and recreational value. During recent years it has been used extensively in the reforestation of waste lands. This species is effectively retaining its high place in forestry largely because of the progress that has been made in the development and general application of practical measures for the control of blister rust.

During the period 1918 to 1921 the United States Department of Agriculture in cooperation with the affected States experimentally developed and demonstrated practical control measures. The problem was simplified by the fact that the disease lives alternately on the white pine and on the leaves of currants and gooseberries. It can not be communicated directly from one pine to another. Therefore it is possible to control the disease locally by the systematic eradication of all currants and gooseberries within infecting distance of white pine. This distance varies with local conditions, but experience in the Eastern States has demonstrated that any white-pine stand can be adequately protected by uprooting all currants and gooseberries within 900 feet of the trees. In addition, the cultivated black currant, on account of its susceptibility to infection and its importance in aiding the long-distance spread of the disease, must be eliminated from white-pine regions. In this experimental work more than 14,000,000 wild currants and gooseberries were eradicated from 1,036,903 acres of land at an average cost of 38 cents per acre, the cost being reduced from an average of 72 cents in 1918 to 18 cents in 1921. Since 1922 the United States Department of Agriculture has cooperated with the 12 Eastern States in which the disease has become established in vigorously prosecuting a joint program to secure the systematic and general application of control measures. Effective educational and service activities with white-pine owners have resulted in willing and generous cooperation in control work.

Control Work in New England and New York

In New England and New York during the period 1922 to 1928, 25,000 individuals and 853 town appropriations made available more than \$567,000 for cooperative control work. Also, thousands of individuals have given up growing cultivated currants and goose-

berries to help protect the white pine. As a result of the general application of local control measures, 5,450,075 acres of land have been cleared of about 53,000,000 wild currant and gooseberry bushes at an average per acre cost of 18 cents. If the experimental control work performed prior to 1922 is included, it is apparent that since 1918 control of the rust has been established on 6,486,978 acres of land by the initial eradication of these bushes. This acreage includes the protection zones around pine stands. To maintain control on the protected areas, it will be necessary to rework them after a period of five to seven years to destroy any bushes that were missed or that have grown from seed or broken roots.

Other Control Activities

In conjunction with the protection of the natural pine stands, the cooperating States are taking adequate action to eliminate the cultivated black currants and to safeguard white-pine plantations. These States are also protecting the white pine in their State forests and are securing the application of control measures by nurseries producing white pine to assure the growing and distribution of disease-free planting stock. The white-pine areas in the eastern national forests and parks are likewise being protected by the timely eradication of currant and gooseberry bushes.

In the Lake States, Pennsylvania, and New Jersey the establishment and spread of the disease has been relatively slow. Cooperative blister-rust control activities in these States have included scouting for the disease, eradication of infection centers, and investigational and educational work. During recent years there has been a gradual increase in the amount and distribution of the disease which became especially evident in 1927 and 1928. Consequently, these States are now actively undertaking to secure general and systematic application of control measures to protect their white-pine forests.

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BORON in Irrigation Water May Hurt Citrus and Walnut Orchards In 1926 W. P. Kelley, of the University of California, discovered that a certain type of injury to lemons and walnuts was associated with the occurrence of boron in irrigation water. This type of injury had been known for some years, but the fact that boron caused it was not known. It has long been recognized that rocks and minerals rich in boron are widely distributed in California and Nevada. The waters of several lakes and springs in those States contain salts of boron in solution, often in relatively high concentrations. For many years borax and boric acid have been produced in commercial quantities from mineral deposits and from the brines of salt marshes in the desert regions of that area.

In view of these facts it is not surprising that boron should be found as a normal constituent of the salts occurring in irrigation supplies, and its presence had been reported a number of times. However, there was very little information as to the quantities of boron carried in solution in the stream or well waters used for irrigation, for the

reason that, while it is possible by simple tests to determine the presence of boron in a solution, it requires a careful and somewhat tedious laboratory procedure to determine the quantity present. Prior to the discovery that boron was in some cases an injurious constituent of irrigation waters very few quantitative determinations of it had been made.

Evidences of Boron Injury

While it is probably true that boron as it becomes concentrated in the soil solution may cause injury to a number of different crop plants, the most conspicuous evidences of such injury are shown by citrus and walnut trees. These evidences appear in the leaves. Of the citrus varieties the lemon is probably the most sensitive to boron injury and its symptoms are the most pronounced. These symptoms appear only on the full-grown and more mature leaves, where a yellow color develops along the leaf margin and between the larger veins, and the affected leaves fall from the tree prematurely. With the walnut, which is normally deciduous in California, the symptoms of leaf injury do not appear until mid-August, when the leaves are full grown. The leaf margins then die and turn brown, and beadlike dead spots develop in the tissue between the veins.

It has been found that where such plants as citrus and walnut trees are injured by boron in the soil solution, the boron content of the leaves is much higher than is normal for uninjured trees. This fact makes it possible to assign a chemical cause for the visible symptoms. The boron content of the leaves of normal healthy trees of citrus and walnut in California may range from 50 to 200 parts per million of elemental boron, based on the dry weight of the leaf material. In leaves where definite evidences of boron injury are found the boron content usually ranges from 500 to 1,500 parts per million.

Sources of Boron

Boron is found in injurious concentrations both in the waters of surface streams and in those from deep wells. Where it occurs in stream waters it is usually possible to trace it to its source. Each surface stream has many tributary springs or smaller streams. When these are examined it is found that the waters of most of them contain very little boron. The boron contributed to the main stream usually comes from one or at most a few sources in which its concentration is relatively high, and the quantity of water involved may be very small. It thus becomes possible to diminish the boron content of the main stream by isolating the tributary that yields the major contribution of boron.

Where irrigation water is obtained from wells, it is found that even when several wells tap the same body of underground water there are marked differences in the boron content of the different wells. If boron troubles develop from the use of underground water, it is possible to locate the well or wells that are contributing the high-boron water and either discontinue their use or else use the water on crops that are less sensitive to boron injury.

In most instances the occurrence of boron in springs or wells is associated with hot water and presumably with volcanism. It is not true, however, that all hot waters are contaminated with boron, or that all boron waters are hot. It has not been possible, as yet, to cor-

relate the boron content of waters with other characteristic constituents. In California high-boron waters are usually alkaline in reaction, and it is assumed that the boron is in combination as a borate salt. In view of the uncertainty as to the character of this combination, it is deemed advisable to report analytical results in terms of elemental boron rather than as a borate or as boric acid.

Concentrations of Boron

Boron has been found in all samples of irrigation water that have been analyzed for that element in the present investigation. In the waters of certain mountain streams close to the melting snow the boron content has been as low as 0.05 part per million. There are many irrigation supplies, including the Colorado River, in which the boron content appears to be below the point of ultimate injury to crop plants, ranging from 0.1 to 0.3 part per million. On the other hand, there are a number of wells and surface streams used for irrigation in which the boron content ranges from 0.4 to more than 1 part per million. In a few wells, streams, and springs the waters contain up to 6 and 7 parts per million. In most cases these latter waters are known to be injurious to nearly all crop plants.

From such evidence as is at present available it seems probable that where the concentration of boron in the soil solution is low, that is, not above 1 to 2 parts per million of that solution, it is not injurious to most crop plants and may be beneficial. It is evident that with respect to the upper limits of tolerance, crop plants differ very greatly. Such plants as citrus and walnut trees appear to be injured when the boron content of the soil solution remains long above 5 parts per million. Other plants such as the cereals, alfalfa, and possibly some of the deciduous fruits appear to withstand concentrations of 15 parts per million or possibly more.

It should be emphasized that under the ordinary methods of irrigation the concentration of salts in the soil solution is much higher than in the irrigation water used to replenish the soil solution. A part of the irrigation water is lost from the soil by evaporation, and another part is absorbed by the plant roots. None of the salt brought in by the irrigation water is evaporated, and very little of it is taken in by the plants. Consequently the soil solution is the residue left from evaporation and plant absorption and is much more concentrated than the irrigation water. This is true with respect to boron as well as the other salts. The continued use of an irrigation water containing, for example, 8 parts per million of boron may be expected to result, in a few years, in a boron concentration of 8 to 10 parts per million in the soil solution.

The Safe Limit a Difficult Problem

While it is possible to determine with a fair degree of accuracy the tolerance of a crop plant to the concentration of boron in soil solution, the safe limit for irrigation water is more difficult to decide. If the system of irrigation is such that all the water applied is held by the soil of the root zone and there is no leaching, then the boron content of the soil solution will be increased approximately at the rate at which boron is brought in by the irrigation water. The quantity of boron absorbed by the crop plants or precipitated from solution in the soil is

probably but a small part of that brought in. On the other hand, if the system of irrigation is such that the root zone is leached occasionally, and a part of the soil solution, rich in boron and other salts, is replaced by the more dilute solution of the irrigation water, it may be safe to use water having a higher boron content than otherwise.

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BOYS' and Girls' Club Work Has Influence on Family Relationship

Educators have long since recognized the function of the teacher in directing the learning of his pupils toward certain specific objectives. Changes in knowledge, skill, and attitude with reference to certain objectives continue to be the primary concern of the school.

Recently the problem of improving the health of school children has brought many educators face to face with the fact that the school alone can not greatly improve the children's health unless changes are also made in the health program of many homes. Not only must the school recognize the family unit as an elementary influence to be dealt with in any program of change directed toward the individual child, but all agencies working with youth are forced sooner or later to face this problem.

On the other hand, whatever changes the school, the 4-H club, or other organized youth movement may make in the boys or girls included in it will be reflected in the family situation and lead either to improved relationships or to more tensions within the group.

The following interview with a 19-year-old farm boy illustrates how the family relationship is affected by the tension developed between an older and a younger brother because of the participation of one in 4-H club work. There are many other factors in the family situation than just the club activities of the younger boy that are causal to the total situation, but the interview illustrates how carefully an outside agency must consider not only how its program may affect the individual, but the total of human family relationships of the entire group.

Boy's Problem Told to Interviewer

After spending an evening with the family the interviewer talked to Henry, the younger son.

"Henry, you have made a good start in the dairy business."

"Yes," the boy replied, "but I would like to buy a place over by K. The owner will take a note for it. My older brother and I don't get along together very well. He says that I feed my stock too much. When I told dad that I thought I would leave this place he said that he was sorry that was the way I felt about it. If I would stay I could have the home place, but mother and brother would be sore (especially as the brother and his wife are now living with the family) and it would not be pleasant living here."

The interviewer asked, "Has your father always been interested in club work?"

"Yes; but my older brother has not been. I work here and I don't get a cent. I take care of my stock, pay for their keep, and dad gets the milk. He owes me \$900, which I could get if I wanted to take

stock. He was sick and I had to quit school to work. I had a scholarship to the college short course this winter, but I can't go as I have my stock to care for. I wouldn't ask dad to milk and care for them as he doesn't feed as much as I do. I hate to leave dad, but there isn't anything here for me."

"Why don't you stay until you are 21 and save enough money to make a payment on your place and have a little working capital before you leave?"

"It might be best to wait awhile. I have 14 head of purebred stock of my own and a good team. I guess I ought not to have told you all this."

This ended the interview. The club participation of the boy no doubt changed him greatly in his knowledge and skill in raising dairy stock and in his attitude toward scientific farming. And it also was an important factor in creating family tensions centering principally around the older and younger brother relationship.

Solidarity Between Parents and Children

In contrast to this story, the following statements made by parents illustrate effects of club work on parent-child relations that have tended to produce greater solidarity and more frequent and wholesome relationships.

Mrs. Johnson, mother of six children, four of whom are in club work, said:

Well, I am sure club work has had some effect on every family. I know it had on ours. It makes the parents take more interest in what their children are doing and help them more. They can't help noticing the work that the children do when they go to the fair with them and help them with their records and their work throughout the year. It, of course, leads to more knowledge on the part of the parents as to what the children are doing and what the work is all about, and at the same time may also take more of the parents' time, and many do not want to give this much time and attention to their children's work.

Mrs. Hoxie, mother of four children, said:

Yes; we are a club family. All our children have been in as long as they could stay. The boy's work has made him want to take the short course at the college if he can get away, and the oldest girl, who is now a teacher, is also a local club leader. I always helped the children since we had no leader, and they have all learned to make their own clothes and have won some prizes and trips as a result of their work.

Interviews with over a hundred farm families whose children are club members from which these comments are taken show that in 75 per cent of the cases a closer and more wholesome parent-child relationship results from participation in the club program, while in 25 per cent of the cases tension of one kind or another develops.



FIGURE 9.--Club girls cooperate in making the home attractive

Club Influences Widely Felt

The study upon which the foregoing statements are based indicates that such organizations as elementary schools, secondary schools, 4-H clubs, boy scouts, and camp fire girls can not change individual members without some effect upon the social relations of the entire family, whether or not such change is intended. Participation of any member of the family unit in a new activity becomes immediately a stimulus about which the immediate attention of the entire family centers and results in a changed relationship between the person who participates in the new activity and the rest of the family. This changed status of the individual either leads to readjustments which makes the family life more pleasant and interesting or produces tension in the group

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BOYS' and Girls' Clubs Promote Cooperation in Community Affairs

One of the outstanding needs of rural life is the development of greater cooperation among farming people in community affairs. The 4-H club program recognizes this need and aims to develop constructive group action and group control. Club leaders strive to focus the attention of their groups on vital issues in home making and agriculture. They arrange for contacts with other organized groups and encourage members to respect the rules laid down by the majority. They make it possible for each member to assume a share of responsibility and to conquer self-interests when necessary for the good of the group. Throughout, club leaders aim to develop constructive ideals with every attempt in organized group effort, especially through club meetings, club programs, public demonstrations, trips to other parts of the State and county, contacts with other organizations, and the attainment of the club goals established by the members themselves. Because good fellowship is essential to group unity, many opportunities for its development are provided in the recreational program of each club.

The attention of club members is continually centered upon community affairs, particularly as they affect the farm and home. They learn to recognize and to meet local needs under varying conditions, and gain valuable experience in citizenship. Loyalty to the group and the desirability of giving up personal desires for the good of the group are increasingly emphasized. It is a common practice for 4-H clubs to elect members as delegates to general extension meetings and other farmers' and young people's meetings, where they report what the clubs have done toward carrying out the community program in the growing of crops, the raising of livestock, the preparation and conservation of food, the making of clothing, or the general beautification of the home. It is a part of their responsibility also to take back to their own club groups reports of these meetings, and of general observations made en route, especially those relating to farm and home life.

Club members engage in many community activities as effectively as do adults. These activities give them a feeling that they are a definite factor in community development. In addition to the activities relating to farming and home making, the general community activities undertaken by clubs as a whole often include landscaping the school grounds, refurnishing the town hall, improving the grounds around the

village railroad station, or raising funds for the needy. By such means young people may be kept in touch with the best in rural life and may develop a keen sense of civic responsibility as well as genuine leadership in making their community a better place in which to live.

A Typical 4-H Club Member

What can be accomplished in community building through 4-H club work is illustrated in the story of John Visny, born of Slovak parents on a Connecticut farm. When John was 15, he attended an open meeting of a 4-H health club and there met the county agent. A year later this boy won the national junior championship in judging dairy cattle. Meanwhile he had become interested in dairying primarily and in better silage corn, certified seed potatoes, farm accounts, home improvement, and a community program. In a comparatively short time, through John's initiative, a young farmers' club was organized and a social center provided. With the help of the State college specialists and the county extension agents, farming methods of the community along the lines in which John was interested, were greatly improved. In addition, John was instrumental in organizing a club in dairying and one in making clothing. He helped to make it possible for the young men of the community to attend a trade school in an adjoining city. There is scarcely a club member in his county who has not felt the influence of John's work. This youth is now doing creditable work at the Connecticut Agricultural College.



FIGURE 10.—Club members laying foundation for drinking fountain at a 4-H club camp

Girls, through their 4-H club work, often play a very important part in community development. Many older club members are organizing and leading clubs of younger girls, arousing renewed interest in home making through their public demonstrations, staging community pageants, reviving participation in community singing, and rendering beautiful what before were unsightly spots in the community.

Club leaders believe that the joy and satisfaction gained by farm boys and girls in later years from watching the vigorous growth of a community in the development of which they have had a part well recompenses them for the effort expended. Because of such participation in its development, these young people of a community often become its most useful citizens. The growing demand for increased club work throughout the United States and the general interest in it throughout the world is evidence that these underlying principles in community cooperation and community building as developed in the club program are recognized and appreciated by those interested in a progressive rural community life.

GERTRUDE L. WARREN,
Club Organization Specialist, Extension Service.

BOYS' and Girls' Clubs Stress Farm, Home, and Community Requirements

Boys' and girls' 4-H club work represents the junior phase of the cooperative extension work of the land-grant colleges and the United States Department of Agriculture. Extension work in agriculture and home economics is based on the Smith-Lever Act of 1914 and related Federal and State legislation. An important feature of the Smith-Lever Act is that it provides for farm boys and girls a system of teaching supplementary to that provided by the schools. Junior extension work was established simultaneously with the work for adults. The Capper-Ketcham Act, passed in 1928, provided for further extension work in agriculture and home economics with men, women, boys, and girls.

Since the beginning of boys' and girls' club work, there have been differences in viewpoint as to the aims of the work. Some extension workers have held that the primary aim of club work is to improve practices in agriculture and home economics and that the training of the boys and girls is secondary; while others have contended that the fundamental aim of the various club activities is to develop the boys and girls through action on farm, home, and community problems. The purpose of the Smith-Lever Act is to improve practices on the farm and in the home and to better rural life in general. In keeping with the spirit of the act, the instruction offered boys and girls should truly educate them. Four-H club work aims harmoniously to develop the head, heart, hands, and health. Club work is organized and supported by Federal, State, and county funds and is therefore a part of the public education system of the United States. The club enrollment is approximately 700,000.

A significant thing about club work is that the training is practical. Like the adult extension work, instruction is given through projects, problems, demonstrations, and other means under the supervision of a county extension agent or a club leader. Boys usually have projects in crop or animal production and girls in gardening, poultry, clothing, cooking, and nutrition, or some other phase of home making. Club members keep records of their projects and prepare a report on the completed work. Club members must use initiative in working out their problems. Information from books, bulletins, and other literature is applied to the solution of specific problems.

Student's Interest Required

Best results in teaching are obtained when the student is interested, either because he likes the subject or needs the information. Club membership is voluntary. The boys and girls select their projects and demonstrate the results of their achievements.

Four-H club work is based on local farm, home, and community needs. It recognizes that social, civic, and economic conditions are changing, and it provides training to meet new situations. Rural boys and girls have many problems related to the farm and the home. Four-H club work aids rural youth in working out their difficulties. Club members are taught the skillful use of the hands in everyday tasks. To do something worth while, in the best possible way, is fundamental in club work.

Health conservation is a laudable objective in any educational program. One of the pledges of 4-H club work is, "My health to better

living." Boys and girls are taught simple but important principles of the care of the body. The importance of personal cleanliness is stressed. Club members receive instruction in proper diet and appropriate clothing. Food preparation and conservation, and making clothing constitute a part of the training for girls.

Four-H club activities afford opportunities for cooperation. Club members are taught to have respect for the rights and interests of others and to work for the benefit of the community.

Technical Knowledge Imparted

Another object of the 4-H club program is to develop more efficient producers and consumers. Knowledge and skill in farming and home making, and the application of that knowledge and skill, are stressed. To become an efficient consumer, a knowledge of foods, clothing, home equipment, and culture is essential. Club work aims to develop appreciation of these values. It also teaches boys and girls how to profit from their labor and how to utilize their earnings to the best advantage. Many boys and girls save their earnings from year to year until sufficient funds have accumulated to pay a portion or all of their expenses in high school or college, while others use their funds each year to purchase clothing, enlarge their enterprises, and to improve their home surroundings. Club work is a potent influence in stimulating many boys and girls to remain longer in school.

To understand how to use and enjoy leisure is essential in a well-rounded life. Club boys and girls are taught how to play together as well as how to work together. Games, contests, plays, songs, and picnics constitute a part of each club meeting. At the State club camps, members assemble from all sections of the State for recreation.

Club work teaches that the farm is a good place to enjoy life on a moderate income. It affords farm boys and girls opportunity to find themselves and to learn what farming has to offer when modern methods are used. Participation in club activities is helping many farm boys and girls to become leaders in community, county, and State affairs. The educational value of 4-H club work is obvious. The work should be expanded until it reaches all rural youth. It is probably too early to predict what ultimate effect club work will have on rural people; but there are numerous illustrations to show that it is one of the most effective means of giving rural boys and girls a better opportunity for self expression and for a more contented, happy, and progressive rural life.

E. H. SHINN,
Senior Agriculturist, Extension Service.

BROOMCORN Industry Affected by Changing Technic and Demand

Broomcorn producers have been able to gage their planting more closely to requirements through the information furnished by the Government on production, distribution, and consumption, and through this service the general trend of the industry has been more closely followed by growers. This places them in a better position to anticipate and meet various problems in the industry which are coming into existence through changing conditions.

Chief among these changes is the general and persistent trend of the broom trade toward the use of common and medium grade broomcorn with a corresponding decrease in the use of so-called parlor quality. Whether this shifting in the demand is controlled by price or is the result of an actual preference for lower quality is problematical, but the effect on the industry has been far reaching.

From the producers' standpoint, at least, the continued preference for common to medium grade broomcorn has encouraged its increased production, particularly in the Great Plains areas of the Southwest where the climate is usually not favorable to the production of the highest quality. Land is relatively cheap in this area and production expenses are comparatively low. The development of the motor truck, which now permits hauling broomcorn long distances in these districts where railroad transportation has been lacking, is a further inducement to the use of remote semiarid land for broomcorn.

In contrast, the decreased trade demand for high-grade parlor brush, either because of its higher production costs or because lower grades supply present quality demands, has tended to discourage the growing of broomcorn on the more expensive and humid lands further east where more expensive methods for curing high-quality brush are necessary. Should this demand for lower grades of broomcorn continue, it is likely that production of broomcorn, as in the past, will continue to shift to new or cheaper lands and will be abandoned in localities in which other and more stable crops offer equal or more lucrative returns.

Producers Striving to Reduce Costs

All branches of the broomcorn industry are making efforts to lower production costs on both the raw and finished product in order to meet the increased demand for broomcorn of moderate cost. This is particularly true of producers in Colorado and Kansas where binders for harvesting have come into use. To harvest instead of to "pull" the brush by hand lowers the cash costs of harvesting and it is not necessary to rush the preparation of this usually lower type of brush as was the case when a higher quality was demanded. Therefore family labor can be used. The saving of labor cost accomplished by this rather new method of handling broomcorn at harvest will probably encourage larger individual plantings, particularly in sections in which weather conditions permit proper drying of broomcorn in the shock.

Producers are not alone in their efforts to lower broomcorn costs as is indicated in the increased interest in storage at primary points. Interest savings on high freight rates from producing sections to the seaboard, to Canada, Cuba, and other remote manufacturing centers encourage storing of broomcorn at or near points of production until needed. This possible saving to manufacturers has had strong support in the use of bonded warehouses and Federal broomcorn inspection. Although comparatively new in broomcorn marketing, these warehouses provide dependable storage at moderate rates and the brush, when officially graded, is accurately identified with the United States inspection metal-sealed tags, and thus becomes a safe collateral for loans.

Just what effect the rapidly increasing chain-store activities are having on the broomcorn industry is as yet undetermined, but the distribution of broomcorn to the large factories, usually at large manu-

facturing centers that supply this trade, has increased. This fact seems to reflect a concentrated buying power in contrast with the former more widely distributed purchases among smaller concerns throughout the country.

Use of Substitutes Increasing

Of most concern to the broomcorn industry is the increased use of substitutes and imitations. Substitutes for broomcorn, or material to be mixed with it, which have come on the market from time to time, have had little direct market effect on the commercial crop of broomcorn. A recent importation, rice straw, closely resembles broomcorn in appearance but its use is not general. It is not seriously competitive in point of wearing quality, but its relatively low prices invite use in low-grade brooms. Mechanical substitutes for sweeping have undoubtedly made serious inroads in the broomcorn industry.

New or changed uses for broomcorn are limited, but modern schemes in household decoration have created a demand for certain types of brush that can be uniformly dyed in solid colors to meet the special color schemes. Then some factories are now making brooms without the use of "hurl" or the longer lengths of broomcorn. If these brooms are favorably received it will further increase the demand for the shorter lengths of brush.

G. B. ALGUIRE,
*Associate Marketing Specialist,
Bureau of Agricultural Economics.*

BUILDING Program to House Department Is Now Well Under Way

The housing situation of the Department of Agriculture has long been the cause of inconvenience and inefficiency because of the large number (over 40) of the buildings occupied by the department in various parts of the city of Washington. As old activities expanded and new activities developed, provision of additional space became necessary. This need was met by renting buildings here and there in the city of Washington, and, since the close of the war, by utilizing space in the temporary buildings erected for service during the war. This situation is now in the way of definite and notable improvement as a part of provision for public buildings made by congressional enactment. More than 20 years ago two units of a great building for the Department of Agriculture, since then known as the east and west wings, were completed, occupied and almost immediately overcrowded. Construction of the central unit connecting these two wings and intended to house the general administration of the department was delayed, but is now well along toward completion and the building is expected to be ready for occupancy in 1930. The illustration (fig. 11) shows the appearance of the new construction with a part of the west wing to the right. When the entire structure is completed it will present an imposing front of 750 feet from the east end of the east wing to the west end of the west wing.

The central structure shown in the illustration has an impressive entrance lobby and staircase. In the interior finish in the lobby several different kinds of marble are used. The base of the building is of gran-

ite and the superstructure and Corinthian columns of marble. The main 5-story part incloses a court, which is paved on a level three steps below the general level of the ground and is glassed in above the second floor. A small fountain adorns the center of the court. This court will be devoted to decorative purposes, not being intended for offices of any kind. The offices of the Secretary of Agriculture will occupy the second floor front, just behind the columns. The rest of the unit will be occupied by the offices of the Assistant Secretary, the various directors and other administrative officers. A feature of special interest on the front side is the entablature, the long panel resting upon the capitals of the columns. On this entablature are engraved the following inscriptions:

The husbandman that laboreth must be first partaker of the fruits.—Saint Paul.

No other human occupation opens so wide a field for the profitable and agreeable combination of labor with cultivated thought as agriculture.—Lincoln.

With reference either to individual or national welfare agriculture is of primary importance.—Washington.

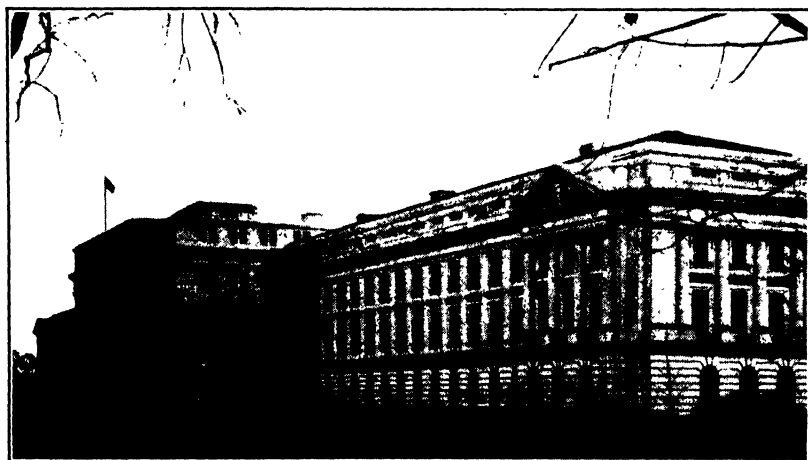


FIGURE 11.—The new building (center) now joining the hitherto detached wings, which were first occupied in 1908

The total amount authorized for the construction of the central part shown in the illustration is \$2,000,000. The design was drawn by Rankin & Kellogg, architects of Philadelphia, and approved by James A. Wetmore, Acting Supervising Architect of the Treasury Department.

Building Will Cover Three Blocks

Another long step toward adequate housing for the department will be taken when construction begins upon a great office and laboratory building south of the above-described structure and connected with it by bridges across the intervening street (B Street SW.). The plan contemplates a building covering, when completed, three city squares. A reproduction of the architect's outline drawing of the proposed building (fig. 12) gives a general conception of the plan. The picture shows, rather inadequately, the new central unit, the west wing, one of the overhead bridges across B Street, and the general arrangement of the 10 long wings making up the office and laboratory building. The central two wings of this building, running north and south, are for imme-

diate construction as soon as the site, an entire city block, is acquired by the Government.

The architecture of this building, while not monumental in character like the Administration Building, is nevertheless dignified and sightly. The space provided by the first unit to be built is not sufficient to permit abandonment of all rented quarters, but will still make it possible to bring in several important bureaus now housed in rented buildings, remote from headquarters, and, incidentally, effect a notable saving in rentals.

As the Government's building program for Washington moves forward, additional construction for the Department of Agriculture will continue the expansible building depicted above toward the east and toward the west until the entire plan covering these city blocks is realized. Then it is expected that all branches of the department will

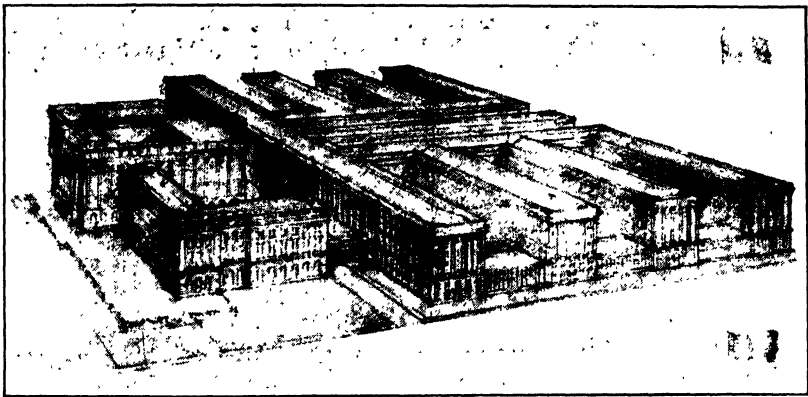


FIGURE 12. - Architect's drawing of the buildings as planned

be adequately and properly housed in one location, and that the drawbacks to efficient administration, now necessary incidents of work conducted in scattered and often unsuitable buildings, will be removed.

W. W. STOCKBERGER,

Director of Personnel and Business Administration.

CANNING Industry's Output Grows Under Food and Drugs Act

The consumption of canned fruits and vegetables has grown by leaps and bounds since 1906, when the Federal food and drugs act was passed, and a

fair proportion at least of this increased consumption can be traced directly to the operation of the law. For in the years preceding the enactment of the Federal pure food law the consuming public had very little confidence in canned foods. In fact, the old adage "Let the buyer beware" was particularly applicable to such foods.

A large proportion of commercially canned foods in those days was adulterated, misbranded, or improperly prepared. The records show that canned tomatoes frequently contained as much as one-half added water and that peas and beans were often colored with salts of copper, which are injurious to health. Harmful preservatives, such as boric and salicylic acids, were frequently added, and saccharin was some-

times used in place of sugar. Sanitation in the canneries was bad, and the canner's carelessness or ignorance in preparing his goods caused much spoilage.

The better element in the industry at once gave the Federal food officials hearty cooperation. Not only did intelligent canners advocate a stringent enforcement of the food and drugs act, but they

supported the movement for scientific research on the part of the Government and of the industry designed to solve the canners' problems, to insure satisfactory canned products, and to educate canners in methods which would result in wholesome and legal products. Most canners were therefore informed rather than reformed. As a result of this cooperation and the continued application of the provisions of the law, canned foods to-day occupy an enviable position

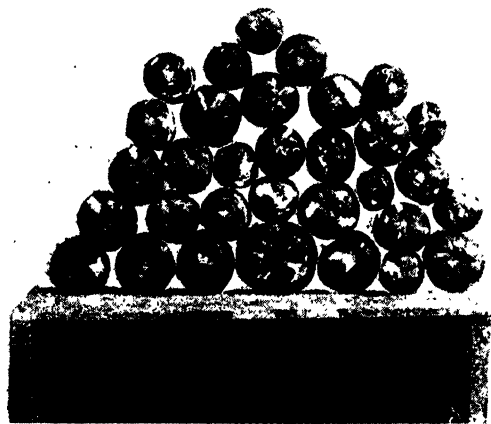


FIGURE 13.—The food and drugs act stopped the use of decomposed tomatoes

in public confidence, as is evident from the annual expenditure of millions of dollars for such foods. Fruit and vegetable canneries now serve as dependable markets to farmers throughout the United States. To make sure that these markets may be retained and expanded, the Food, Drug, and Insecticide Administration is constantly at work to prevent the small number of dishonest or ignorant manufacturers who have entered this field, along with every other line of business, from cheating consumers and detracting from the good reputation which the canning industry has earned.

Every year the canning plants in the United States are inspected systematically. The inspector going through each cannery follows the raw fruits

or vegetables from the time they are received at the plant throughout each canning operation to the finished product. As he goes along he points out any changes in practice which he believes would improve the products being prepared and insists upon changes in operations that would keep the finished products from being in harmony with the requirements of the food and drugs act.



FIGURE 14.—Filthy canneries were common before the food and drugs act was passed

The following excerpt from an inspector's report of a factory inspection of a tomato-catsup factory illustrates the work being done along this line.

An inspector employed by the firm, stationed at a small building at the entrance of the cannery grounds, stops the trucks bringing in the tomatoes, takes three boxes at random from different parts of the load, and dumps the contents into trays for a close examination of each tomato. If the boxes contain any considerable number of green or partially rotten tomatoes the truckman must sort the bad ones from his load. Otherwise it will not be accepted. I watched this operation for an hour. Almost every load delivered consisted practically entirely of firm, red, ripe tomatoes, reasonably free from cracks and blemishes.

This procedure may seem at first to be hard on the farmer, but, as a matter of fact, only a few farmers would deliver unfit tomatoes to a cannery. To protect the interests of those delivering good stock and to insure to the public canned goods of such a quality that they will come back for more, is really a protection to the farmer as well as to the consumer.

The inspector's report continues:

After this preliminary inspection the tomatoes are dumped on a moving belt, where two women remove some of the blemished fruit. The tomatoes continue their journey on this traveling belt to a revolving washer. Here they pass through 14 water sprays, under a pressure of 80 pounds, which insures thorough washing.

From the washer the tomatoes pass on to a final sorting belt, where five more women carefully remove any unfit tomatoes that may still remain. As this is the final separation of the good from the bad, I took three bushel baskets of tomatoes that had passed the sorters and examined them carefully. This examination shows the sorting at this plant is very efficient. The raw material going into this firm's catsup compares favorably with what a housewife might use in her own home.

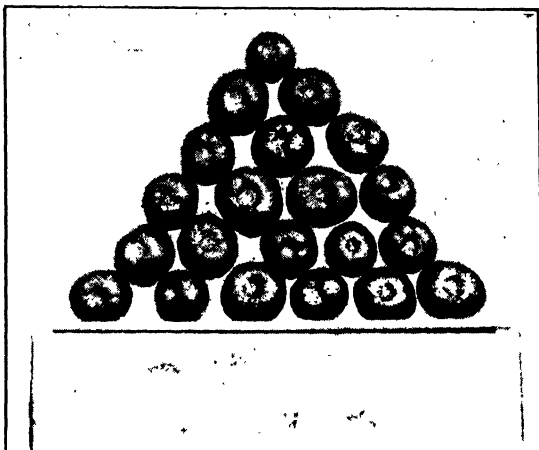


FIGURE 15.—These tomatoes make good catsup

Tomatoes Scalded in Steam Tanks

Next the tomatoes are scalded with steam in large cypress tanks. Then they are pumped through clean glass-lined pipes to the cyclone machines, very similar to the household utensil known as a "ricer," except, of course, on a much larger scale and driven by electricity. In passing through them the tomatoes are first pushed through a coarse-mesh sieve and then through a fine-mesh sieve, when the skins, cores, and seeds are removed. The resulting thin pulp is pumped to the "kitchen," where it is cooked until the desired thickness is obtained. Vinegar, spices, and other flavoring materials are next added. While the mixture is being constantly stirred with wooden paddles it is cooked and concentrated still more. This "finished pulp" is run into porcelain-lined tanks and cooled, and then pumped through a machine very similar to the "cyclone," where the pieces of whole spices are removed. This finishes the process of manufacture. The catsup is then heated to 200° F. and bottled.

Steam and hot water are used to clean this entire system three times daily, first in the morning before canning starts, later before operations are resumed after the noon hour, and finally at the close of the day's operations.

In addition to the care taken during the process of manufacture to insure a wholesome, clean catsup, laboratory tests are made upon samples taken every hour. This examination is made according to the method developed in the microanalytical laboratory of the Food, Drug, and Insecticide Administration.

Producers of fruits and vegetables for commercial canning may rest assured that this type of supervision, which is extended to all canneries shipping in interstate commerce, has contributed and will continue to



FIGURE 16.—Clean factories are now the rule

contribute toward public confidence in canned foods and toward a resultant larger market for these farm products.

GEORGE P. LARRICK,
*Administrative Assistant,
Food, Drug, and Insecticide Administration.*

CATTLE Malady Called Anaplasmosis Results from a Blood Parasite

A disease of cattle, known as anaplasmosis, has been found locally in several Southern and Western States. It generally appears during the summer months in malignant form, and the symptoms and postmortem findings indicate that it is infectious. The disease has been confused by some with anthrax and hemorrhagic septicemia. Others have considered it to be a type of forage poisoning. But recent investigations into its nature and cause have shown definitely that the malady is a blood protozoan disease called anaplasmosis.

A study of the blood of sick cattle has revealed signs of very severe anemia with the causative parasites appearing as small globular bodies in the red blood cells near their borders. Sir Arnold Theiler, an eminent authority, who investigated the disease in South African cattle, appropriately named the blood parasite, *Anaplasma marginale*.

Anaplasmosis is prevalent in many parts of the world, notably in south, central, and north Africa, Formosa, Java, Philippine Islands, Transcaucasia, Italy, Argentina, and Brazil. In the United States it has been positively identified in Florida, Louisiana, Texas, Oklahoma, Kansas, Nevada, and California, and it seems probable that some other States also have centers of infection.

Symptoms of the Malady

Generally, the first symptom noticed is a diminution in the milk secretion, but for several days the animal may have a nearly normal appetite. Then there is marked weakness; the gait is stiff and there is a tendency to lie down frequently. At this stage, there is almost complete suppression of the milk flow, with loss of appetite and stopping of rumination. There is a decided costiveness and more rarely a diarrhea with occasionally blood-tinged feces. The urine is normal, never bloody as in Texas fever. The temperature is usually high at the appearance of the first symptoms, ranging from 104° to 107° F., and may remain thus for several days. As the animal becomes weaker and lies down, the temperature falls to about normal and shortly before death may be subnormal. Respiration is very short and rapid, accompanied by expiratory grunting sounds. The pulse is likewise greatly accelerated. There is increased flow of tears and often a drooling of saliva. The visible mucous membranes of the head are very pale and may have a yellowish cast. There is always a marked falling off in weight, the animals having a very gaunt appearance with sunken eyes. In fatal cases death may ensue in from two days to a week or more from the onset of symptoms. The mortality rate may attain 40 per cent of the affected cattle. In cases of recovery, the convalescence is remarkably slow, usually requiring several months before the animal regains its normal condition.

Adequate Control Measures Await Results of Research

The post-mortem findings include an anemic and jaundiced condition of the mucous membranes and other tissues, thin watery state of the blood, numerous small blood spots on the heart sac, the surface of the heart, and the lining membrane of the chest cavity, degeneration of the heart muscle, enlargement and degeneration of the liver, distention of the gall bladder with thick pasty bile and very marked swelling of the spleen.

In other lands where anaplasmosis is prevalent, several different species of ticks have been shown to be capable of transmitting the infection. In the United States, however, experimental work on this phase of the problem has not yet progressed far enough to indicate in just what manner the parasite is propagated outside the animal body and spread to susceptible cattle. Until this work is completed adequate control measures can not be prescribed.

L. T. GILTNER,

Senior Veterinarian, Bureau of Animal Industry.

CHEESE Factories in Southern States Are Operating Successfully For many years it was thought that cheese factories could not be operated successfully in the South because of unfavorable climatic conditions. In 1913 a cooperative extension agent of North Carolina investigated the possibilities of cheese manufacture in the southern-mountain districts. He found that as far back as 1892 the making of cheese in the home was an important industry in some of these districts and that many of the farmers still made an inferior quality of cheese. He also found that climatic conditions were very favorable for the production of

good milk and the manufacture of good cheese and that it was the custom when building a farm house to erect it near a spring, which offered excellent facilities for the cooling of milk.

As a result of this investigation, the first cheese factory in the southern mountains opened in North Carolina on June 5, 1915. The building

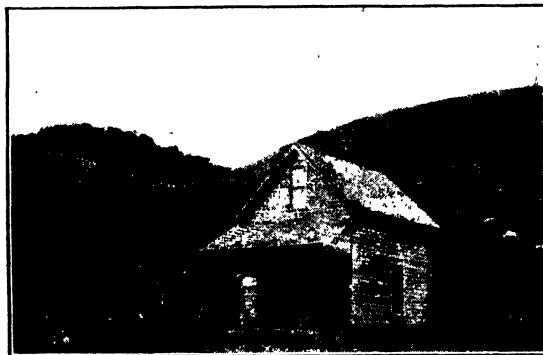


FIGURE 17. —First cheese factory in southern mountains (located in North Carolina)

ing was very small, being 14 by 16 feet in size. The complete cost, including equipment, was \$400. (Fig. 17.) During the next 10 years several cooperative factories (fig. 18) were organized in the mountain districts of North Carolina, Tennessee, Georgia, Virginia, West Virginia, and Kentucky. These factories were larger than the first one and cost from \$800 to \$1,800

each. They were organized to utilize more profitably the surplus milk from beef cattle. This surplus formerly was made into butter and cheese on the farm and netted the farmer in cash only about one-fifth of what the factories paid. Automobile trucks were not being used and the roads at times were impassible. For successful operation, therefore, it was necessary to obtain a sufficient volume of milk within a short distance of the factory. Since this could not be done in sections where only beef cattle were milked, the factories survived only in those communities where there were a few herds of dairy cattle in addition.

No Dairy Cows When Factories Started

Practically no dairy cows were found in these sections at the time the factories started operation. Soon afterwards, however, a few carloads were shipped in from the North. A large number of the purchasers knew little about the care, feeding, and breeding of dairy cows. As a result many were unsuccessful as dairymen and disposed of their cows. Most of the factories in these sections operated for only a short

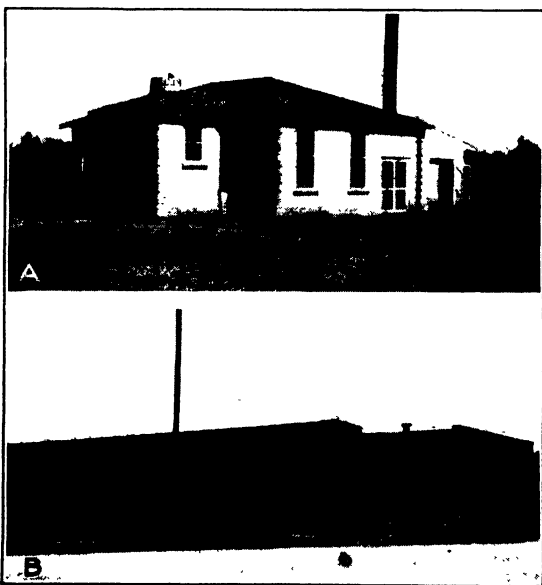


FIGURE 18. —Cooperative cheese factories in southern mountains

time and then closed because of an insufficient volume of milk. A few farmers in some communities went into the dairy business on a larger scale. Cheese factories in these communities have made progress and are to-day operating successfully. The milk is cooled in springs, and a good-quality product is delivered at the factories. This makes it possible to manufacture a good quality of cheese from unpasteurized milk.

In 1928, because of improved roads and the use of automobile trucks, even larger factories were established in the mountain districts, and milk was gathered from larger areas. At this time the operation of cheese factories in the southern mountains was no longer an experiment, as it had been found that a good quality of cheese could be made if proper methods were used.

It was still believed that cheese factories could not be operated successfully in the lower altitudes of the Southern States because of unfavorable climatic conditions. Some good-quality cheese, however, had been made in western Tennessee, and in 1927 one of the large cheese companies started a factory in Mississippi. It was successful and very soon the cheese industry extended into Alabama, Arkansas, Texas, and Oklahoma, where the climate is much warmer than in the mountain sections. Many of the factories are of modern design (fig. 19) and well

equipped. Although some are cooperatives, most of them are owned and operated by individual companies. The capacity of the factories ranges from 10,000 to 70,000 pounds of milk daily, which is much more than that handled in the factories formerly built in the South. As the herds in these States are usually small and somewhat scattered, in order to get a sufficient volume of milk it is necessary in some localities to operate routes within a radius of 30 miles of the factory, which has been made possible by improved roads and the use of automobile trucks. The milk usually arrives at the factory about noon, some of it with an acidity of 0.25 per cent and occasionally higher. Pasteurization makes it possible to handle milk with this high acidity.

Seventy Per Cent of Southern Factories Pasteurize Milk

Cheese factories throughout the South are being operated successfully where a sufficient volume of milk is received and proper manu-

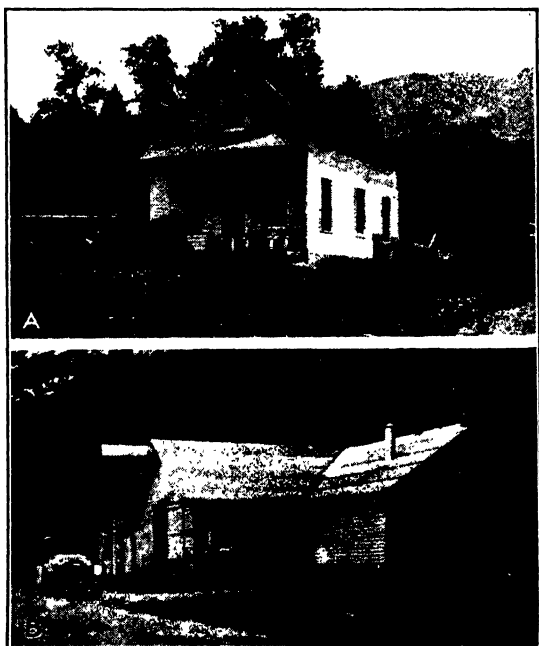


FIGURE 19.—Modern cheese factories in the South

facturing methods are used. Where milk is gathered from large areas and has developed considerable acidity when received, a higher and more uniform quality of cheese and larger yields are being obtained at factories that are properly pasteurizing such milk. About 70 per cent of the factories in the South are pasteurizing the milk at 160° F., by what is known as the flash method. Since only the smaller factories are not pasteurizing, it is safe to say that at least 90 per cent of the cheese manufactured in the South is made from pasteurized milk. The factories are usually equipped with mechanical refrigeration unless the cheese is shipped to a central curing plant or cold storage when from one to five days out of the press.

In 1914 no cheese factories were operating in the South. In 1928 approximately 60 factories manufactured over 6,000,000 pounds of cheese valued at over \$1,000,000.

H. L. WILSON,
*Associate Dairy Manufacturing Specialist,
Bureau of Dairy Industry.*

CHESTNUT Blight Does Not Mean Early End of Tannin-Extract Industry The United States now obtains from Argentina, Natal, India, and other foreign countries over one-third of the vegetable tannins used in the making of leather. The American chestnut is the source of over 50 per cent of the tannin materials grown in this country. The manufacture of tannin extract from chestnut wood and bark developed especially



FIGURE 20.—One of the large chestnut-extract plants now operating in the southern Appalachians

rapidly during the World War, when the demand for leather was increased and the importation of tannin from foreign countries was limited. The decreased demand for tannin following the war and the consequent price reduction have necessitated the abandonment of some of the chestnut-extract factories in the southern Appalachians. However, recently developed processes for making paper and fiber board from the chips left after the extraction of tannin seem to have mate-

rially improved the financial condition of the extract industry. Figure 20 shows one of the 21 chestnut-extract plants located in the southern Appalachians.

Unfortunately, both the chestnut-extract and the chestnut-board industries seem doomed by the chestnut blight. This disease is caused by an Asiatic fungus (*Endothia parasitica*) which was first reported in this country near New York City in 1904. The blight, which usually kills a tree in one to five years, has spread so rapidly on the native chestnut that there is only a very small percentage of chestnut alive north of Mason and Dixon's line. In the southern Appalachians the disease has also spread at a very rapid rate, so that at the present time, as shown by Figure 21, a large part of the growth of this region is infected or killed.

Dead Wood Loses Tannin Very Slowly

The death of the chestnut stand does not mean the immediate end of the chestnut-extract industry, as dead wood loses its tannin very slowly. Studies have recently been carried out, in cooperation with the Bureau of Chemistry and Soils and with chemists of the chestnut-extract industry, on trees that had been killed by belting or by forest fires in a number of localities in the southern Appalachians. These trees are considered fairly comparable to blight-killed chestnuts. The studies indicate that the percentage of tannin in trees dead as long as 25 to 30 years is not materially less than that in living trees. Blight-killed trees lose their sapwood and bark within a few years after their death. However, the loss of the sapwood, which averages only about one-fourth inch in thickness and has a low tannin content (2 to 4 per cent), is of little importance. Even the loss of the bark, which has approximately the same tannin content as the heartwood (7 to 12 per cent), is not always a serious matter, because peeled wood is necessary in some of the processes for utilizing the chips left after the extraction of tannin. Of course, a large part of the chestnut stand will not be available for the manufacture of chestnut extract, because it will be utilized for other purposes or will be lost through forest fires and decay of the heartwood.

Even though it is possible to use native chestnut trees for 30 years after their death to make extract, the probability of finding and grow-

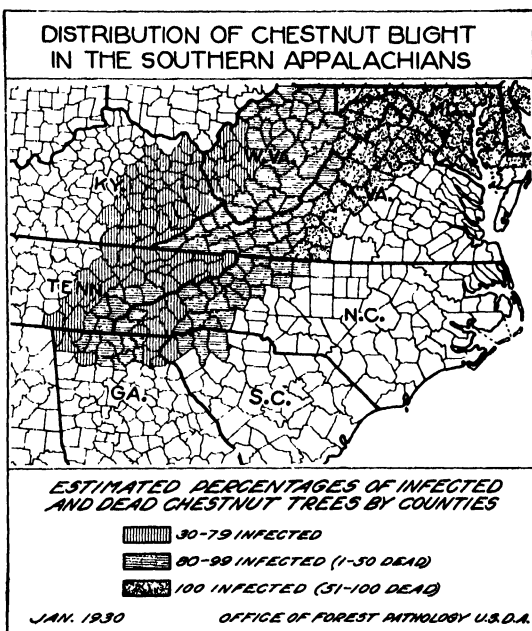


FIGURE 21.—Distribution of chestnut blight in the southern Appalachians

ing enough blight-resistant chestnuts in time to provide for the continuation of any material part of that part of our present extract industry now dependent on chestnut is rather small. The results of extensive searches for blight-resistant American chestnuts made in the earliest infected regions and the investigation of the reports of resistant trees, seedlings, and sprouts have been rather disappointing, as most of the trees have turned out to be only blight escaping instead of truly blight resisting. Work is being continued with the most promising sprouts and trees. The Asiatic chestnuts are more promising, as observations in this country and in Asia indicate marked resistance to the blight when the trees are growing under favorable conditions. An expedition of the Bureau of Plant Industry has spent two years in Japan and Chosen (Korea) selecting seeds from blight-resistant forest trees, and many thousands of seedlings from them are now growing in this country. Further studies are necessary before the value of these trees for extensive planting operations can be determined.

G. F. GRAVATT,
Senior Pathologist, Bureau of Plant Industry.

CHLOROPHYLL, Cause of The universal green color of
Greenness in Plants, Is plants is familiar to all of us. The
Influenced by Nitrogen substance which is responsible for
this green color has been called
chlorophyll. It is an organic material composed of the elements carbon, hydrogen, oxygen, nitrogen, and magnesium. Pure chlorophyll is not a simple organic compound but consists of a mixture of two very similar components which have been called a and b. Two yellow plant pigments which are closely associated with chlorophyll in leaves are carotin, the yellow coloring material of butter and of carrots, and the less commonly known xanthophyll, which is found in the yolk of eggs.

Chlorophyll has been studied more intensively than the other plant pigments and while there are still many questions concerning it which remain unanswered, some things have been learned about its great importance in connection with the growth of plants. Chlorophyll is the pigment which is connected in some way with the production of organic matter in the plant and this production is related in a complicated and not fully understood way to sunlight. The energy coming from the sun is thus utilized by the organic compounds to produce the material of which the plant is composed. In the process carbon dioxide and water are used by the plant and oxygen is given off. The association of chlorophyll with the production of organic matter is quite important for it is by this means that all our food products are made. There is some evidence for believing that in this constructional process chlorophyll is being constantly formed and broken down in the leaf, and that the amount present at any one time is the result of these building-up and tearing-down processes. The rate of formation of carbohydrate is proportional to the amount of chlorophyll present. A plant in which the leaves are rich in chlorophyll will grow more rapidly than one in which the leaves are deficient in chlorophyll, other conditions remaining the same.

Fundamentally Important to Agriculture

Since chlorophyll is so intimately connected with plant growth it is of fundamental importance to agriculture, and investigators are now attempting to determine more of its properties, how it works, and how to control it, if possible. Experiments to show the effects of various fertilizer ingredients upon the building up of chlorophyll have been performed and it has been shown that fertilizers high in nitrogen cause plants to become a very deep green readily. Potash which has such pronounced effects on certain other phases of plant growth seems to have a relatively small effect on the greening of plants. A fertilizer high in phosphorus seems to produce plants which have more chlorophyll than those fertilized mainly with potash and less than those fertilized mainly with nitrogen.

It has been found that the character of the soil has much to do with the chlorophyll content of plant leaves, some soils favoring a higher content than others. In some soils, also, there seems to be no relation to the kind of fertilizer added and the amount of chlorophyll produced.

Effects on chlorophyll content are also found which can be traced to variations in the weather, differences being found according to whether it is day or night, bright or cloudy, hot or cold, but these data are so involved that much work remains to be done to reduce the information to well ordered knowledge.

FRANK SCHERTZ,

Associate Biochemist, Bureau of Chemistry and Soils.

CHRISTMAS Tree Demand Is Means of Improving Pike National Forest "Where must I go to get 11 carloads of Christmas trees?" was the opening sentence in a letter addressed to the district forester at Denver, Colo., recently. Eleven carloads means about 35,000 trees. Back in 1920, when serious thought was first being given to forest improvement through possible Christmas-tree demand, a sale of 100 trees was made on the Pike National Forest. Considerable persuasion was required to make this first sale. The purchaser was skeptical about the practicability of securing salable trees through improvement thinnings. By 1925, when 10,000 trees were cut in the Pike National Forest, the success of the venture was fairly well assured. For the season of 1928, 20,000 trees were cut.

The Denver market normally demands about 40,000 trees annually, plus some 500 tons of boughs for grave blankets, wreaths, and rope. Boughs are incident to Christmas-tree cutting operations since many of the trees cut are not salable as Christmas trees. For instance, a thinning operation sufficient to yield 10,000 salable trees requires ordinarily the cutting of from 250,000 to 500,000 trees, with a resultant thinning on 50 to 100 acres.

Prior to the entrance into the field of the Forest Service, local demand for trees was supplied by promiscuous and destructive cutting on private lands or by vandals who cut the tops from thousands of trees along mountain highways and roads.

Fir Stands Too Thick for Good Growth

Scattered throughout the foothills region of the Pike National Forest are thousands of acres of young stands of Douglas fir much too thick

for proper growth. It is these stands which are sought out by forest officers and thinned. In a properly conducted thinning operation in dense stands of from 1,000 to 10,000 trees per acre, ranging from 5 to 20 feet in height and from 15 to 40 years of age, all trees are cut except 500 to 1,000 of the better and more vigorous specimens. These are left to grow into large trees which at maturity are suitable for railroad ties and lumber. On experimental plots of 1 acre each it has been found that the annual diameter and height growth on the thinned plot is two to four times greater than on the unthinned check plot.

The production of Christmas trees through improvement thinnings on the Pike National Forest pays its way under almost all conditions. In average stands the operation shows a fair profit. On exceptional areas an acre has yielded 500 salable trees. These trees were sold at a flat price of 15 cents each, cut and in the woods. The cost of cutting was 5 cents per salable tree, leaving a net return per acre of \$50. Net returns of from \$5 to \$25 per acre can reasonably be expected in our average young stands of Douglas fir. This is the immediate profit. The future profit in the way of greatly increased growth in trees left can only be guessed. It is evident, however, that trees suitable for lumber and ties will be obtained in much less time and that the quality should be much higher.

E. S. KEITHLEY,
Supervisor, Pike National Forest, Forest Service.

CHRISTMAS Trees a Profitable Farm Crop in Some Localities Christmas-tree growing offers the farmer a profitable side line that brings in extra income at a time of year when it is particularly acceptable. Moreover, it suggests a way to utilize odd corners of tillable land not needed for other crops or waste land suitable for reforestation.

It is, of course, essential that a ready market for the trees be available. Before starting a plantation, nearness of markets, possibility of strong competition from wild or natural-grown trees, and the presence of other similar plantations should be considered. Generally speaking, the Eastern and Central States offer the best opportunities.

The ideal Christmas tree should be symmetrical with a dense conical crown, fragrant, and retentive of its foliage in a warm room. The species selected should grow fairly rapidly in order to make the business pay. The spruces and true firs combine many of these qualities.

Norway and blue spruce are hardy through the East and Middle West and make excellent Christmas trees. (Fig. 22.) The Norway spruce (*Picea excelsa*) is more rapid growing than blue spruce (*P. pungens*) but is not so beautiful a tree. White spruce (*P. glauca*) is particularly well adapted to the colder parts of the country. Among the true firs, white fir (*Abies concolor*) and Nordmann fir (*A. nordmanniana*) are suitable for Christmas-tree planting. Balsam fir (*A. balsamea*), because of the tendency of its foliage to thin out when planted outside its natural range, is not so good as the others mentioned. Douglas fir (*Pseudotsuga taxifolia*) makes a good Christmas tree. To insure hardiness, stock grown from Rocky Mountain seed should be insisted upon. Deodar cedar (*Cedrus deodara*), a tree brought to the United States from Asia, is particularly well adapted to growing on the Pacific coast and in the warmer parts of the Eastern and Central States.

Establishment and Care of Plantation

Good, strong 4-year-old transplants should be used. These may be obtained from reputable nurserymen or from State foresters; they are trees that have been transplanted for at least one year in the nursery. If cultivation is contemplated, a spacing of 4 by 4 feet is recommended. If not and if Christmas-tree production is incidental to timber growing, the spacing may be reduced to 3 feet or a little less; and as trees become salable they can be taken out as thinnings.



FIGURE 22.—A Christmas-tree plantation of 4-year-old Norway spruce transplants: A, During the first growing season; B, three years after establishment

Cultivation shortens the time when some income may be realized from the plantation and reduces fire hazard. Preparation of the site by fall plowing and disk harrowing in the spring is advisable when cultivation is to be practiced. The weeds may be kept down and the growth of the trees stimulated by running a cultivator between the rows three or four times each summer for the first two years. When

cultivation is discontinued, the maintenance of a plowed fire line around the tract affords protection from fire.

With sturdy transplant stock and the treatment described above, trees should begin to reach merchantable size (4 to 7 feet in height) within four or five years after the plantation is started. Not all trees grow at the same rate. Because of this, additional trees will reach salable size each year. By the time the plantation is 10 years old practically all of the trees originally set out should have been harvested.

While the trees most readily sold are from 4 to 7 feet tall, there is a growing demand for trees of table size $1\frac{1}{2}$ to 3 feet tall. These may be sold either as cut trees or as living trees, with roots packed in wet moss, in tin cans or pots. These trees begin to reach table size about two years after planting.

Home-grown trees bring the best prices because of their freshness and symmetrical form. Cutting may be delayed until orders are actually obtained. Handled in this way the crop is in no way perishable, for any surplus may be held for sale the following year.

F. H. EYRE,

Associate Silviculturist, Forest Service.

CLUB Activities Are Followed Up in Father-and-Son Partnerships Cooperative extension work in agriculture and home economics includes activities for men, for women, and for boys and girls. Separation of adult and junior activities has been quite complete, although often conducted along closely related lines. With this segregation, the county

extension agent is often confronted with the question of what extension work can be done by rural young people from 20 to 25 years of age. Many 4-H club members reach their fullest development at about the time that the maximum club age is reached. Unless some special activity is arranged for these young people, the extension agent is often deprived of their assistance just as they attain the ability to render most



FIGURE 23.—County agent explaining farm accounts to club members and their father

efficient service in extension work. Many extension agents have attempted to meet the situation by urging them to become local leaders of 4-H clubs. The interest of some of the former 4-H club members is thus maintained, but the larger number not in club work or who have not previously been in club work are not reached. Some special type of activity for this particular group is needed.

Extension workers in Minnesota have provided a new plan. The maximum age for 4-H club membership in that State is 20 years. As club work has been conducted in Minnesota for many years, numerous club boys with several years of experience in organized 4-H clubs have now reached the age when they should be assuming some responsibility in the farm business. Many other young men of the same age group on the farms of the State have not been members of 4-H clubs.

Plan Started by County Agent

To interest young men who are beyond 4-H club age, a father-and-son partnership plan has been established in certain counties, especially in Redwood and Martin Counties. The plan, first instituted by the county extension agent in Redwood County, involves a partnership of father and son to carry on some particular phase of farm work under the direction of the extension agent.

The lines of work chosen for these two counties are dairying, poultry, baby beef, swine, and sheep. Some of the older boys entered a rental-lease partnership for the entire farm business. The ages of the boys range from 20 to 26 years. Monthly meetings of a business and social nature are held. These regular meetings may be varied or supplemented by an inspection tour or a picnic. Farm business records are kept on the particular work included in the partnership project. At the end of the year these records are submitted to the State club



FIGURE 24.—Farmers and their sons learning seed-corn selection from the county agent

office and farm management department at the agricultural college. During the winter months a lecture-laboratory course on The Business Side of Farming was presented to the Redwood County group. Last year a joint representative of the 4-H club department and the farm management department at the Minnesota College of Agriculture was appointed to supervise the father-son partnership activities in the southern counties of the State.

Rural young people seemingly welcome an extension activity designed especially for them. An organization for social purposes alone holds such a group only temporarily and does not warrant the efforts of extension agents. The partnership project, however, not only familiarizes the group with extension activities but provides a workable basis for wholesome social relationship.

R. A. TURNER,
Senior Agriculturist, Extension Service.

COOPERATIVE Associations Aided by Extension Service in Marketing State extension specialists in marketing have rendered substantial service to farmers and their families. The specialists

have been able to get the most effective results and multiply the services rendered by working through the county agents and the farm organizations. Such joint effort aids in determining the outstanding marketing problems and makes attempts to solve them more effective.

The marketing specialists of South Carolina found that the greatest handicap in obtaining a profitable price for farm products was lack of standardization. Through shipping-point inspection in cooperation with the South Carolina asparagus growers, the asparagus industry in this State climbed from a low-quality place on the New York and Boston markets to the top in three years' time and increased its acreage 300 per cent. Shipping-point inspection brought about improved pro-

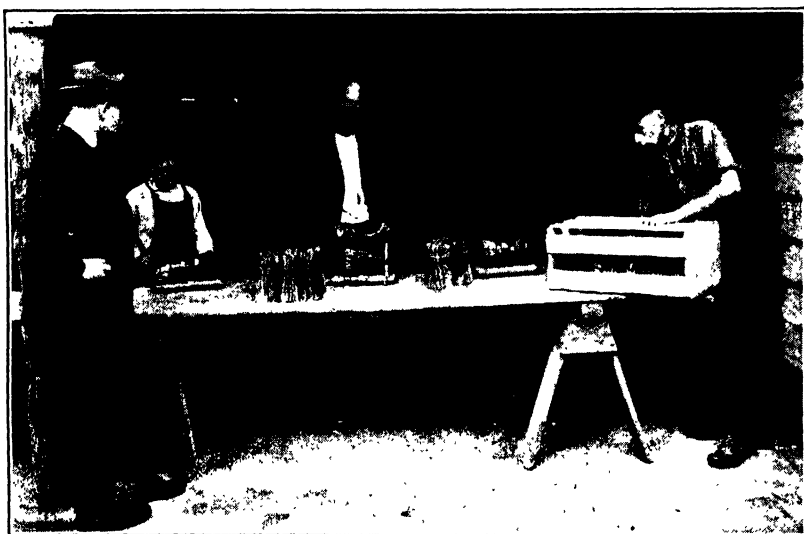


FIGURE 25. --Farmers putting into practice new methods of bunching and packing asparagus taught by extension agent

duction methods as well as a change from a slack pack of low quality to a full pack of top quality. By proving to the asparagus producer that increased returns resulted from these marketing methods, the extension specialists led several other organized groups of fruit and vegetable growers to adopt similar methods.

The marketing economists in Ohio have been active in pointing out to members of cooperative marketing associations that highest net returns can be obtained for the producer only when a high-quality product is delivered for sale.

Three examples may be cited. An analysis of the veal calf shipments in one Ohio county showed that 66 per cent of its veal calves sold at a premium. The owners of the premium calves have been active members of a purebred sire project started six or seven years ago. In the same county only 40 per cent of the lambs are being sold in the top grades on the market. The trouble is with the producer, who has not appreciated the importance of controlling parasites and the ne-

cessity of proper feeding to make finished lambs at weights demanded by the higher-quality market grades. In one year a 20 per cent improvement in the quality of lambs was made.

Losses in Transit

In Shelby County, Ohio, an analysis of 1925 and 1926 shipping records of the livestock-shipping association showed an annual loss of \$3,500 from dead and crippled animals in transit. A further analysis showed that 82.4 per cent of the loss occurred in hog consignments, which comprised 63 per cent of the total head shipments for the two years. This hog loss was equivalent to an insurance rate of 7 cents per 100 pounds shipped in 1925 and 11 cents per 100 pounds shipped in 1926. The loss was equal to about half the total home-marketing charges of the association. Part of the loss from dead and crippled animals was attributed to improper loading, part to rough handling by the railroad, and part to improper handling of the hogs by the producer just before shipment. Further analysis, in cooperation with the animal husbandry department of the Ohio State University, revealed that the hogs were not receiving sufficient bone-building material on the farm and that much of the crippling was due to faulty feeding. Correction of the feeding methods resulted in cutting the insurance charges to approximately 3 cents per 100 pounds instead of 11 cents, which was the rate in 1926.

Iowa has 8 extension marketing economists; 3 of whom cooperate with livestock-shippers' associations, 2 with grain-dealers' associations, 2 with creamery associations, and 1 with poultry-marketing organizations.

The marketing economist confines his efforts to a single commodity. He must know the essentials of efficient operation of the cooperatives in his field, what records are needed for an accurate analysis of the association's business, and what marketing information the manager and officials of the association must have in order to obtain the highest net returns for the producers. The livestock economists of Iowa keep constant check on net returns from various livestock markets and make available to cooperatives the results of their studies. The grain-marketing economists analyze hedging and credit problems; they also analyze audits of 100 farmer elevators, showing volume of business, expenses, margins on different grains sold, and financial returns on side lines, which are of great interest and value to officials and managers. Similar work with dairy and poultry cooperatives by Iowa marketing economists has proved valuable.



FIGURE 26.—County agricultural agent demonstrating the grading of potatoes for market

Promoting More Uniform Milk Supply

In New England the extension economists rendered service to dairy-men's cooperatives by suggesting adequate means of equalizing the milk supply throughout the year. The late spring and early summer are seasons of high production, while late fall and early winter are seasons of low production. In cooperation with the dairy and crop specialists, the marketing economist tries to impress on the farmer and on the association management the desirability of having cows freshen late in the fall, so that they will reach their peak production when the supply normally is falling off. They also urge the necessity of producing succulent feed and good hay to maintain the flow of milk during the fall and winter.

In several Southern States, home demonstration agents and marketing economists are active in organizing club or curb markets at which members of women's and girls' clubs sell fruits, vegetables, flowers, poultry, eggs, dairy products, and a wide variety of products made by farm women. Sales by southern women at these markets during 1928 exceeded \$1,000,000.

In Okmulgee County, Okla., in 1927, the county agent took the initiative in assisting farmers to establish a better system of marketing eggs. A year later the success of the organization justified reorganization on a 5-year basis. Each farmer candles and stamps his eggs so that they are readily identified as fresh eggs when sold. The central marketing agency sells the eggs with a maximum handling charge of 2 cents per dozen. The association has been so successful that so far not a single member has withdrawn.

Extension work in marketing is in its infancy and has ahead a broad field of endeavor. This fact makes the part of the extension employee one of extreme interest and large opportunity for worth-while service to the farmers of the United States.

B. B. DERRICK,

Cooperative Marketing Specialist, Extension Service.

COOPERATIVE Directors and Officers Have Legal Responsibility One of the more important provisions in the cooperative marketing acts of the various States is that which, in keeping with common law, vests in the boards of directors of associations formed under those statutes the conduct and control of their corporate powers and business. With their detailed provisions respecting the board of directors, these statutes have done much to emphasize to farmers the advantages of the corporate type of organization, and at the same time have impressed upon the directors of the associations that theirs are not merely positions of honor, stripped of responsibility.

A man was prevailed upon to accept membership on the board of directors of a corporation because of the prestige his name would lend to the organization. It was not contemplated that he should participate in the conduct of the affairs of the corporation, neither was he expected to attend meetings of the board. The court held, however, that no understanding which he may have had with the corporation could relieve him from the exercise of that degree of care with regard to the conduct of its business which a prudent man would exercise in his own affairs.

Officers of incorporated associations must exercise diligence and care in the performance of their duties; they are presumed to be familiar with the by-laws of the association and to have taken the ordinary methods to inform themselves in relation to its affairs. If they are guilty of gross negligence with regard to the conduct of the affairs of the corporation, or if they remain silent when they are aware that a fraud is being perpetrated against it, they are liable.

An incorporated association is bound by restrictions imposed by its charter and by-laws, and to that extent the powers of directors and other officers are necessarily limited. Therefore, for acts in excess of their powers such officers are liable for damages caused the association. It has been held, however, that the directors were not liable for acts which are beyond the powers conferred upon a corporation by its charter if all the members of the corporation acquiesced in them.

A phase of the relation of a director to his corporation which has been before the courts many times is that involving his personal interest in transactions in which he participates in behalf of his corporation. It is uniformly held that in view of the position of trust and confidence which he occupies, he can not either directly or indirectly acquire any personal advantage in any transaction on behalf of the corporation.

H. M. BAIN,
Specialist in Legal Phases of Cooperation,
Bureau of Agricultural Economics.

COOPERATIVE Directors In a cooperative association the
Primarily Responsible members delegate the responsibility
for Association Policy for directing the business of the
association to a board of directors.

The board of directors, when elected and constituted according to the by-laws of the association, becomes the legal agent or representative of the membership for the purpose of directing and conducting the business. The directors are collectively and individually liable for carrying out the purposes of the business. They are legally and ethically obligated to determine policies and supervise their execution. The policies must be within the limits established by the charter, by-laws, and marketing agreement of the association. Usually these are rather broad limits and give the directors ample latitude for the development and enforcement of broad general policies as well as major and departmental policies.

Responsibility for all policy formation rests clearly in the board of directors, but it is permissible, in its discretion, to allow the general manager to participate. Since the general manager is to be made responsible for the execution of the policies, it seems proper that he should be a party to their determination, but the board should never permit him to dominate it in the matter of determining policies. He is primarily an executive and should not take undue initiative, or take advantage of an opportunity to get his own policies accepted by the board. One-man control is dangerous to the success of an enterprise, no matter how good the man may be or how excellent his judgment. The consensus of a group of men is to be preferred to the opinion of a single man. Group action may be slow and trying at times, but it proves more successful in the long run.

Directorship Not Merely Honorary

Membership on a cooperative board of directors is usually looked upon as a post of honor, but at the same time it should be recognized as a place of great legal responsibility. A director is expected to exercise the same degree of care in directing and supervising the affairs of an association that prudent and diligent men exercise in the conduct of their own business. Failure to exercise this degree of care, or to be honest and diligent in attending to the affairs of an association, may render directors liable, at common law, to the association, to its receiver, or to members of the association acting in its behalf under some circumstances.

Authorities agree that an association may recover from its directors any losses which it suffers because of their dishonesty. Gross negligence on the part of directors which permits other directors to defraud an association renders all of them liable. Inattention on the part of a director may render him liable to his association in those instances in which attention to duty should have prevented the loss of a specific amount.

Cases are rare, if not nonexistent, in which a director, although inattentive to his duties, has been held liable on account of the general collapse of a corporation, when fraud or specific losses traceable to specific transactions are not involved, but the legal liability of a director emphasizes the importance of policy formation and a careful supervision of the execution of the determined policies.

Realization of the aims, possibilities, and limitations of cooperative business has been a gradual development. Many mistakes have been made and much experience has been gained. Hundreds of farmers have had an opportunity, during the past few years, to get their first real contact with big business. Out of the mistakes and experiences of the past will grow a more conscious need for the scientific establishment of policies for the successful conduct of cooperative associations.

Tendency to Rely on Manager

Many associations have relied to a large extent upon the general manager or some outstanding personality on the board for policy formation. This is probably always the case in new associations where many members of the board are inexperienced. The natural tendency in such cases is to lean rather heavily for guidance upon those with experience. Officials of new associations are often men who were active in the organization campaigns, and, in many cases, the persons who later become directors get their first lessons in cooperative marketing from these executives. The result is the placing of a large degree of dependence on one or two men.

The tendency to lean heavily on one or two men is accentuated by the fact that the director usually spends but little time in close contact with the business problems of the association. As the board meets for only one or two days each month, the director knows very little at first hand about the detailed problems, whereas the general manager is on the job constantly and is well posted.

The solution of the problem of directing and managing cooperative associations lies in the development of leadership. An association's progress is in direct ratio to the character and quality of the men in

control. A new board of directors of a cooperative should assume their legal and ethical responsibilities by immediately formulating definite and stable policies.

JAMES S. HATHCOCK,
*Senior Agricultural Economist,
 Bureau of Agricultural Economics.*

COOPERATIVE Marketing of Eggs Is Stimulus to Poultry Industry Each of nine cooperative associations marketed over 1,000,000 dozen eggs, during 1928. The total volume of eggs marketed by these nine associations was 104,839,724 dozen. All of these larger associations are located west of the Mississippi River and all but two



FIGURE 27.—Eggs gathered from a poultry ranch in the Petaluma district. The eggs are packed in cases and delivered daily to the cooperative associations

are in the intermountain or west coast area. In the intermountain and west coast areas, the cooperative egg marketing associations have increased the volume of eggs sold year by year. Because of the operations of these cooperative marketing associations in moving local surpluses to the eastern markets, the West has developed several intensive poultry-producing sections where large flocks are handled on a commercial basis. In most of these producing sections, poultry was comparatively unimportant prior to the inauguration of cooperative marketing services.

East of the Mississippi River cooperative-marketing associations are numerous but they do not handle large volumes. They are usually located near large markets and, typically, are the result of an effort on the part of nearby producers to market their eggs on the basis of quality

and to sell them under special brands. In many instances this type of marketing activity is meeting with considerable success.

Chickens are a by-product of commercial egg production or of diversified farming operations. They are frequently pooled in shipments of carload lots of live poultry. A few creameries or egg marketing associations are operating poultry-dressing plants. In the South there is considerable activity in pooling cars of live turkeys and there are a few cooperative turkey-dressing plants.

Throughout the Intermountain and Western States turkey production has become important largely through the operation of turkey-marketing organizations. These are generally collective bargaining associations through which producers sell their turkeys in carload lots direct to wholesale buyers.

GORDON W. SPRAGUE,
*Associate Agricultural Economist,
Bureau of Agricultural Economics.*

COOPERATIVES Recognize All successful cooperative-marketing associations have found it necessary to provide adequate reserves for possible losses. Some of these losses are relatively certain in amount such as losses from bad debts, depreciation, and obsolescence. Other losses are uncertain in amount, but are inherent in every business; these losses are provided for usually by creating a reserve for contingencies.

Frequently, too, cooperatives have adopted the policy of creating reserves to provide for their working capital needs. Funds offsetting this reserve may be used to pay operating expenses during periods of the year when income is inadequate to maintain the association. Working capital is also required for carrying inventories, making advances to growers, carrying accounts receivable with customers, and for other purposes depending upon the type of association and the products handled.

Nonstock cooperatives have found it necessary to make special provisions for capital by creating reserves. Failure to provide adequately for these needs has placed several associations in perilous financial difficulties, even when associations have not been faced by other than the usual hazards incident to business.

It is essential to analyze each of the operations being performed by the association from the point of view of financial losses which might occur. Reserves should then be provided for each possible contingency. Extreme caution in entering upon opportunistic ventures should be the rule followed by the managers of cooperative associations, especially if adequate reserves have not been provided for before entering upon new ventures or methods of marketing.

The management of reserve accounts is most important. It must be remembered that reserves are created for definite purposes. Buildings, equipment, and other such assets gradually wear out or become obsolete. Out of the aggregate of accounts receivable, experience indicates that a rather definitely measurable amount will never be collected. Certain indefinite losses will surely occur. The associations will need funds for operating expenses or for new structures, and for many other known and unknown financial needs.

Assets to Offset Reserves Must Be Liquid

The offsetting of reserve accounts by assets which are not real, defeats the objects for which the reserve accounts were created. For instance, when a balance sheet reveals that reserves for contingencies are offset completely by frozen assets, such as organization expense or other accounts of no liquidity, it is not surprising that such an association has financial difficulty when need for the reserves arises. Assets offsetting reserves must be liquid enough to meet all situations for which the reserves were created.

Reserves are often allocated to growers by issuing certificates of indebtedness. These certificates, when carrying a definite date of maturity, become a certain form of debt, especially in the eyes of the grower members. Consideration should be given to the exact method of issuing certificates. Many associations find it more desirable to allocate merely a portion of the reserves in the form of certificates, keeping the balance on the books of the association. The needs for funds vary, and it is difficult to foretell the necessities that may arise during the life of the association. The policy of paying back the reserves, therefore, needs careful consideration before definitely committing the association.

In setting up reserves, it is best to err on the side of conservatism. Management is frequently overenthusiastic or extremely optimistic, and factors of safety must always be calculated for every phase of the cooperative business enterprise.

Adequate reserves which are available to cover not only the probable but the unexpected losses as well, and to provide sufficient working capital as the association expands, have been found necessary in practically all successful cooperative associations.

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CORN-BORER Battle Enlists Many Kinds of Farm Machinery

The most effective means for control of the European corn borer, that may be applied extensively, is destruction of the pest by mechanical equipment. In applying mechanical-control measures two general conditions must be met: (1) Disposal of the standing stalks and crop debris left in the field after the corn has been picked by machine or by hand and (2) disposal of the whole crop after it has been cut and removed from the field.

Disposal of Crop Débris in the Field

Most of the corn crop debris can be covered by careful plowing, a measure that can be widely adopted. If the infested material is thus covered, the borers migrate when the soil temperature is favorable (50° F. or higher) and come to the surface in search of shelter in other plant remnants. If the stalks are buried to a good depth, trash will not be brought to the surface during weathering or by subsequent tillage operations, if proper tools are selected. With little or no shelter available, most of the borers will perish from exposure or the attacks of natural enemies such as birds and predatory insects.

Another efficient control measure is to detach or sever the stalks flush with the ground, rake them cleanly into windrows, and carefully burn them. For severing the stalks, the stalk shaver of either the wheel type or the sled type effects a nearly perfect job. To each side of the

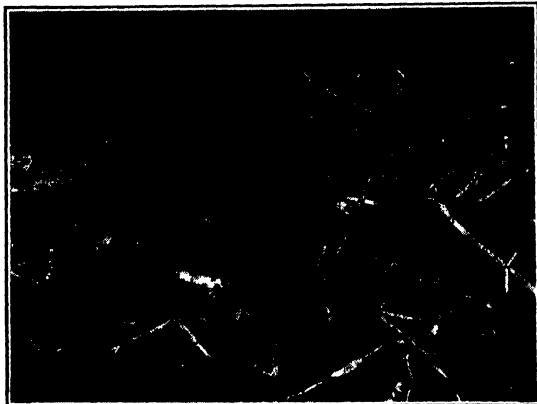


FIGURE 28.—Two-row sled type of stalk shaver

frame of the wheel type, and to each of the runners of the sled type (fig. 28), a serrated knife is mounted outwardly in a nearly horizontal plane to slash off the stalks even with the ground as the implement is pulled forward between the corn rows. Either type cuts two rows at a time, or four rows may be cut by hitching two of the sleds abreast. (Fig. 29.) The wheel type may be obtained from

the farm-machinery manufacturers, and the sled type may be made according to plans that the department will furnish upon request.

Poling or railing to break off the stalks, by dragging a log or railroad iron across the field after a heavy freeze, has been practiced to some

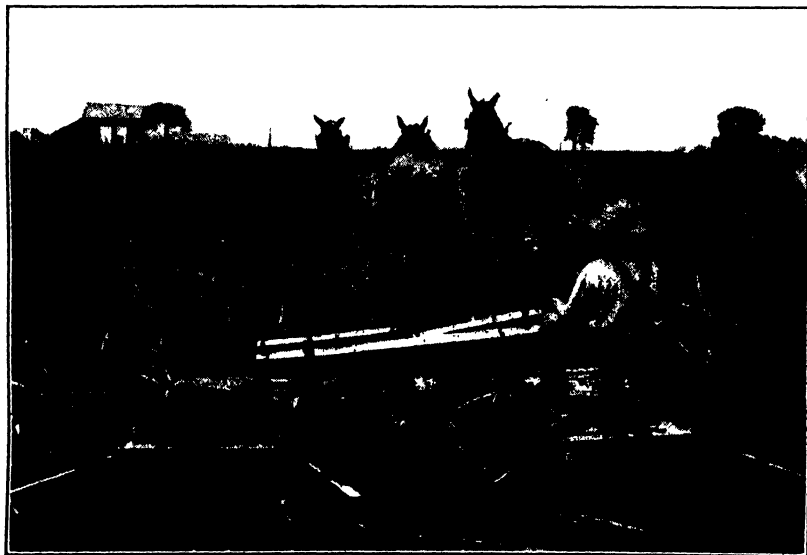


FIGURE 29.—Two sled-type stalk shavers used as a unit cutting four rows of stalks

extent, but is not sufficiently effective for corn-borer control. Often so many of the stalks are not broken off that clean raking is impossible. Also, many of the stalks that are broken off shatter at the butts and cause the contained borers to be scattered about on the ground.

Raking the stalks into windrows for burning, after they have been shaved off, may be done effectively by a side-delivery rake (fig. 30) if the stalk growth is not too heavy. The present type of side-delivery rake was designed for harvesting hay, however, and is not sufficiently sturdy to handle a heavy growth of cornstalks without danger of injury. A dump rake can be used to gather most of the stalks into windrows, and the side-delivery rake for whisking the remaining débris into the same windrows. On windy days, clean raking is difficult with any of the implements, because of the blowing about of the débris.

A special cornstalk dump rake now on the market gives much better results than the regular hay dump rake. It is more rugged, and is fitted with heavier teeth placed closer together. Development of a special side-delivery rake that will handle heavy growths of cornstalks without difficulty and rake them into windrows in one operation is progressing favorably.

Burning of the stalks can be accomplished in the ordinary way when they have been raked into windrows and somewhat dried out. Then, by hand raking into the flames any stalks which may have escaped, practically a complete kill of the borers is obtained.

Experiments have been conducted, and development work is still in progress, with mobile types of burners and a steamer that will burn or steam the standing stalks and crop débris so as to kill the contained borers outright. Owing to the variety of conditions to be met and some mechanical problems involved, these machines are not yet worked out on a practical basis.



FIGURE 30.—Side-delivery rake gathering cornstalks into windrows

Harvesting and Disposal of the Whole Crop

When the whole corn crop is to be removed from the field, the stalks must be cut at the ground surface if all the borers are to be gathered. The standard corn binder leaves stubble at least 4 or 5 inches high, which may contain many borers. Harvesting of the whole stalk may be accomplished with a simple low-cutting attachment which has been developed for use on four popular makes of corn binders. This attachment consists essentially of a long stationary knife to sever the stalks, set below and just ahead of the regular reciprocating knife; an elevating chute to prevent the stalks being cut a second time, by the reciprocating knife; and extension butt gatherer chains and extra throat springs to grasp the stalks as they are cut and carry them into the machine. As the binder moves forward, the stationary knife cuts off the stalks even with the ground while the weeds and grass pass beside the chute and are cut by the reciprocating knife to prevent clogging in

the binder throat. For cutting corn by hand, a special low-cutting tool has been devised. Both the low-cutting binder attachment and the low-cutting hand tool are described, and directions for making them are given, in Miscellaneous Publication 56-M of the department. The attachments may also be obtained from the binder manufacturers.

After the corn is removed from the field, careful disposal of the fodder is necessary. The ensiling process of cutting the fodder into short lengths and blowing it into the silo, effects a high mortality. Should any borers escape the knives, the fermentation process in the silo will cause their destruction.

Another machine, the silage harvester, effects practically the same result if equipped with a low-cutting knife. This machine, which is pulled along the corn row by a tractor, cuts off the stalks at ground level and causes them to pass up a chute into a cutter head where they are cut into approximately one-half inch lengths. A conveyor passes the cut-up corn or silage into a wagon drawn beside the harvester, from which it may be blown into the silo.

The husker-shredder also effects a high mortality in borer-infested stalks. From many tests with used farmer-owned machines and with new machines working under various conditions, it was found that kills of 90 to 98 per cent were obtained when the fodder was fed uniformly, with the machine running at normal speed and adjusted for a high pressure on the snapping rolls. This pressure, of course, should not be sufficient to cause undue heating and damage to the snapping roll bearings. Borers not killed in the rolls, shredder head, or blower may become desiccated in the mow, eaten when fed to stock, or trodden under foot. Fodder passing through a shredder in proper adjustment can therefore be spread upon the fields with little danger. In using either the silage cutter or husker-shredder, care must be taken to dispose of the loose borers found under the machine or in the shelled corn.

In addition to the machines described above, various others have been tried out or are in process of development, all for the purpose of killing the borer. The area infested is increasing rapidly, and so is the intensity of infestation. However, because of the progress already made in developing control machinery, it is expected that effective equipment for preventing extraordinary damage will be available by the time that repressive measures must be adopted generally.

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CORN-BORER Control Much Facilitated by Deep, Clean Plowing

"Clean plowing—a sure means of controlling the European corn borer," is accepted at its face value by most authorities and is becoming a slogan for the Corn Belt. While no one method can best meet all conditions, the plow has been very useful in reducing the number of borers, which can not complete their life cycle underground or live on top of the

ground without protection from birds, other natural enemies, and the weather.

Clean plowing means the complete burial of all trash (figs. 31 and 32), which is necessary for absolute control. It is difficult to bury all the stalks and thoroughly clean fields are seldom found unless plowing has been followed by hand picking. In fact, the first surveys of infested fields made by the corn-borer control forces showed that the average farmer was leaving about 30 feet of cornstalks per square rod of field, which was enough to shelter more borers than were present in the stalks before plowing. Plowing has improved greatly since that time, and a survey in 1928 showed that in the average field in which whole stalks were plowed under 13.1 linear feet of stalks per square rod were unburied when the spring work was finished, no hand picking having been done. One-eighth of the original borers were hiding in these stalks, however, and since the offspring of this number of survivors would ordinarily show a large increase over the preceding year, much cleaner plowing than this is necessary. But the improvement already made, and the interest shown by farmers and manufacturers in better equipment to replace the old as it wears out, are indications of cleaner work in the future.

During the compulsory clean-up campaign of 1927 hand picking and burning were often required to clean fields where the stalks were not well buried by plowing, and this practice was quite effective in killing borers. However, it is tedious, disagreeable work, coming at a busy season, and farm operations should be planned for proper control without it, using methods adapted to the local situation.



FIGURE 31.—Clean plowing to control the European corn borer

Soil Type Affects Cleanness of Plowing

The value of plowing as a control measure depends on the completeness of burial of the trash, and that in turn depends on the nature of the soil and the efficiency of the plows used. Figures obtained in extensive tests on three common types of soils near Toledo, Ohio, show the relative difficulty of obtaining clean plowing. (Table 1.)

TABLE 1.—*Débris left uncovered at*
types of soil

certain

| Soil type | Average total length not with - bare rod | | |
|-----------------|---|-------------------------------|-------------|
| | Best plows ¹ | Poorest plows ¹ | All plows |
| | <i>Feet</i> | <i>Feet</i> | <i>Feet</i> |
| Sandy loam..... | 0.44 | 3.34 | 1.89 |
| Clay loam..... | 2.65 | 9.91 | 6.75 |
| Heavy clay..... | 4.90 | 14.07 | 11.20 |

¹ Average for three plows.

The experiments from which these figures were obtained showed even more clearly than the tabulation that soil type and condition have a very large influence on cleanness of plowing. While Table 1 shows that there was six times as much material uncovered on the heavy clay and three and one-half times on the clay loam as was left on the sandy loam, field observations showed similar differences in favor

of soils which were well supplied with organic matter and well drained.

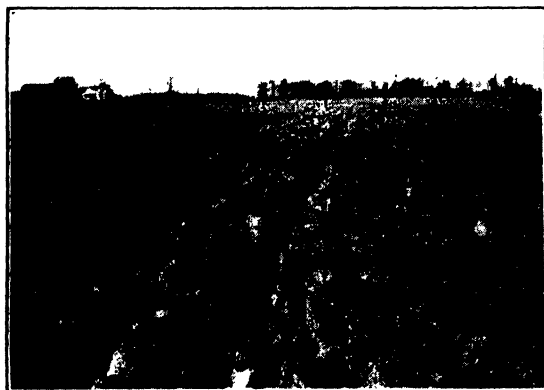


FIGURE 32.—A field on which tests for trash coverage were made

Most sulky or tractor plows of 14-inch width or larger can be made to do satisfactory work on soils which are mellow, easily plowed, and pulverized, either because they contain a large amount of sand or organic matter or because they contain just the right amount of moisture. Plows should be equipped with rolling coulters, jointers, and covering wires, and operated at a depth of 7 inches or more. A skillful plowman can do very clean work with such an outfit in mellow soil, and the few stalks left uncovered may be picked up quickly by a man or boy as the plowing progresses, and thrown into the open furrow to be covered at the next round. The range of conditions under which stubble may be turned under satisfactorily is somewhat wider than for whole stalks.

On heavy, intractable soils, which break up in large tough slabs when plowed wet and in big clods when dry, it is almost useless to try to plow under whole stalks well enough for corn-borer control. The proper procedure is either to pole down the stalks when frozen, harrow down when dry, or cut off at ground level with a stalk shaver; then rake and burn them before plowing. Even if the raking and burning is not a really clean job it will enable the plow to complete a satisfactory measure of control more cheaply than the hand picking that would otherwise be necessary. This practice, of course, increases the need for soil-building crops in the rotation.

On intermediate soils, which can be fairly well pulverized under most conditions, one has the choice of first raking and burning the stalks

and using common plows, or of using the most efficient plows available to turn under the whole stalks.

Characteristics of a Good Corn-Borer Plow

For most efficient coverage, plows should be selected which have plenty of clearance between the beams for the passage of stalks and for setting the coulters and jointers to best advantage, because when jointers and covering wires are used there is a tendency for stalks to clog between the jointer and the beam ahead. (Fig. 33.) The plows should also be free from low cross braces and projecting parts that would catch and drag stalks. The hitch plates on a tractor plow should be adjustable low enough to hold the plow level when operating with the tractor drawbar set about 12 inches above the ground. Hitching high on either the tractor or the plow often causes uneven running and seriously interferes with good coverage.

Large plows, with 16-inch and 18-inch bottoms, as a rule have proven to be more satisfactory than smaller plows on easily pulverized and intermediate soils, though such is not always the case on heavy soils. The shape of the bottom is fully as important as the width, and a type should be selected that lifts the dirt well, curves the upper edge of the furrow slightly forward as it falls, and lays it smoothly against the crown of the preceding furrow. The plow should leave a clean, wide, open furrow, at least 10 inches at the bottom, into which stalks may be turned at the next round. The covering power of bottoms varies in different soils, and actual field trial is the best way to select the right bottom for the conditions.

The plow should be provided with rolling coulters at least 15 inches in diameter; good-sized jointers, either in combination with the coulters, or standing; and a 10-foot covering wire fastened to each coulters shank and another to the axle of the furrow wheel, all of them arranged to drag over the turning furrow slices and keep the stalks from pitching. A good plow equipped in this way and carefully operated at a depth of 7 to 8 inches should turn under whole stalks on reasonably mellow soils to meet corn-borer control standards, unless weather conditions are unfavorable. High winds at the time of plowing will ruin the work of any plow, and even ordinarily mellow soils when too dry or too wet are difficult to plow cleanly.

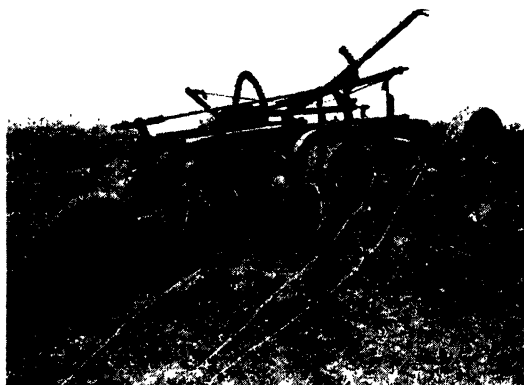


FIGURE 33.—A plow properly equipped for clean plowing, with large rolling coulters, jointers, and covering wires. Notice good clearance between the bottoms, and freedom from obstructions that might catch stalks

Other Helpful Practices

Disking stalks before plowing is sometimes helpful. If the soil is dry and cloddy before plowing, disking may help the plow to pulverize it,

in that way improving coverage and at the same time cutting the stalks into short lengths that are not easily dragged out by the cultivator. On the other hand, if the ground is damp and heavy enough to pack, the disking may leave it more difficult to pulverize and thus hinder coverage. Rolling or dragging the stalks to lean them in the direction of plow travel is a benefit provided the stalks are not broken loose and the ground is not injured by packing. Extension rims on the land wheel of the tractor are sometimes of benefit, since they roll down the stalks and reduce soil packing. Where husking lands conform to plow lands the stalks are easier to turn under than where they are bent opposite to the direction in which the plow travels.

It is difficult to have headlands and backfurrows clean under any condition, as the ground is almost always packed on the headlands and it is impossible to place the stalks at the proper depth on the backfurrows. Disking or harrowing will bring them to the surface even if they appear nicely covered when plowing is finished. Therefore, the best way is to rake and burn these strips before plowing. If a 25-foot border around the entire field is treated in this way, it will dispose of most of the borers that might crawl out of the plowed land into fence rows or other fields to find new shelter for completing their life cycle.

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COTTON Breeding To-day Works with Main Types Known in Remote Past

There are two principal types of cultivated cottons — Asiatic and American. The American cottons may be classified roughly in two groups, the Mexican-Central American and the South American. Upland cotton (fig. 34) belongs to the first group, which is characterized in the main by whitish flowers without spots on the petals, large, smooth, rounded 4-lock or 5-lock bolls, relatively short, white lint, and very fuzzy seeds. The South American group, of which outstanding examples are the Sea Island, Egyptian, and Rough Peruvian cottons (fig. 35), is characterized in the main by yellow flowers with a dark red spot on each petal, rough, pointed, mostly 3-lock bolls, relatively long, cream or buff-colored lint, and smooth or only partly fuzzy seeds. The lengths of lint of these types are shown in Figure 36, and seeds are shown in Figure 37. Bolls characteristic of the two American groups are shown in Figure 38.

The Asiatic and the American cottons are so different that it is very difficult to make them cross or hybridize. On the other hand, it is easy to make crosses between any of the cultivated American cottons. This fact indicates that there is a closer relationship among the American species than between the American cottons in general and the Asiatic cottons.

When cotton plants first attracted the attention of civilized peoples, representatives of all the main groups were already in cultivation and probably had reached very nearly their present stage of development. Modern effort in the improvement of cotton, as of many other crop plants, has been largely a reworking of the materials bequeathed to us by the unknown plant breeders of the remote past.

Sea Island Cotton

Sea Island cotton seems to have been the first subject of intelligent breeding in modern times. It is supposed to have originated in South America and to have reached this country, by way of the West Indies, about 1786. It owes its name to the fact that it was grown in greatest perfection on the islands off the coast of South Carolina. Persistent selection by individual planters led to the production of lint measuring 2 inches or even longer, the longest and finest cotton ever grown anywhere. Only 1,000 to 2,000 bales of these choice strains, the so-called crop lots, were produced annually. European lace makers and manufacturers of fine sewing thread absorbed the product. The spread of the boll weevil to the Atlantic coast in 1916 and 1917 and economic disturbances after the World War put an end to the cultivation of this late-maturing cotton in our territory. It is now grown almost exclusively in some of the West



FIGURE 34.—A plant of the Acala variety of upland cotton, representing the Mexican-Central American group. (Photograph by H. F. Loomis)



FIGURE 35.—A plant of the Pima variety of Egyptian cotton, representing the South American group. (Photograph by H. F. Loomis)

Indian islands.

The Sea Island planters gave extraordinary care to the growing, picking, and ginning of their fine cotton. They were probably the pioneers in practicing annual selection of a superior individual plant and increase of its seed to provide for the planting of future crops. To avoid seed mixture, a small hand gin was used on each plantation in ginning the selected seed. Individual planters were extremely jealous of their choice seed stocks, and the product of certain plantations sustained its high reputation year after year and was in continuous demand by particular European manufacturers.

Egyptian Cotton

Next to Sea Island cotton in length of lint, and hence in market

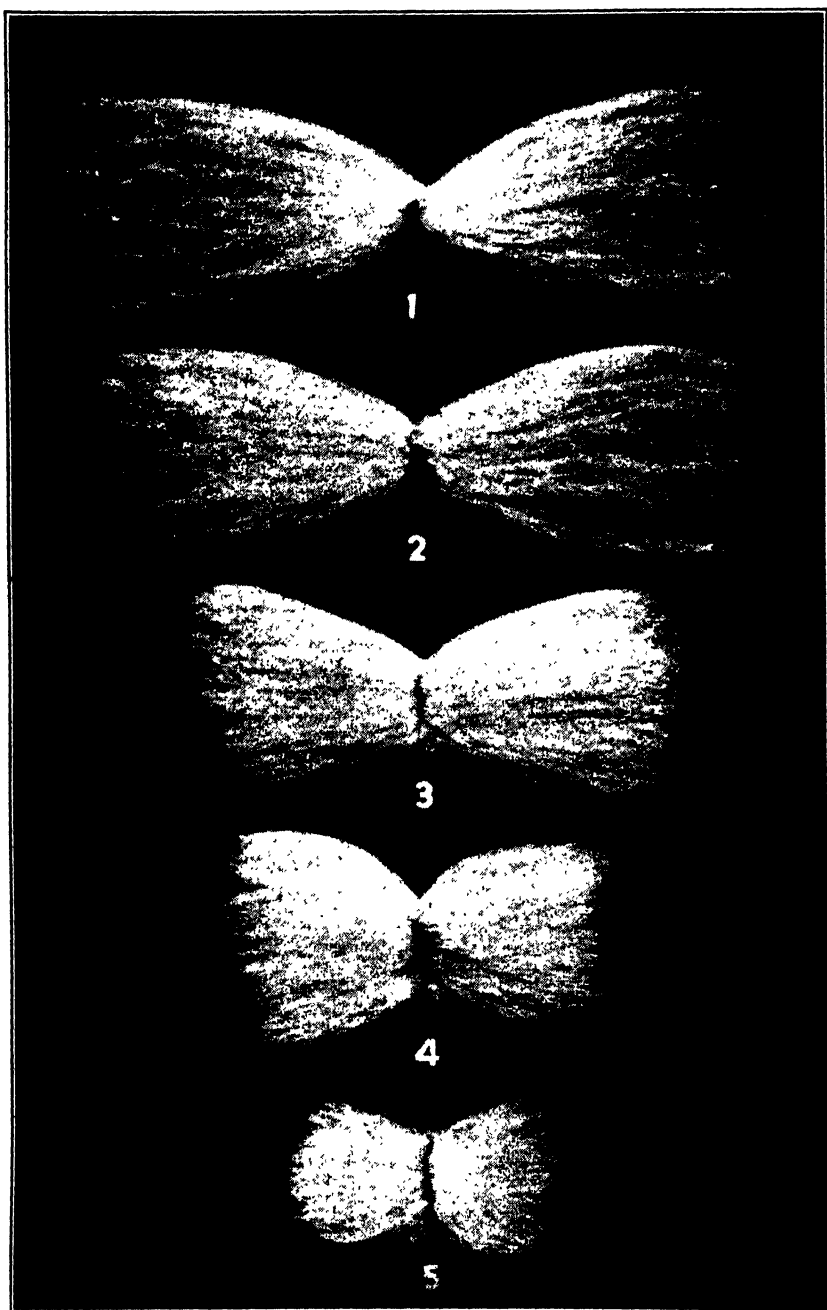


FIGURE 36.—Lint combed out on the seeds to show the range of length in commercial cottons. They are: 1. Sea Island. 2. Egyptian (Pima variety). 3. Long-staple upland. 4. Short-staple upland. 5. Asiatic. (Photograph by R. L. Taylor)

value of the product, are the Egyptian cottons. This type was developed in Egypt during the period 1820 to 1850. Like Sea Island, it clearly belongs to the South American group, but its parentage can only be guessed at. The first well-marked variety, Ashmuni, which is still grown in upper Egypt, had lint of a brownish color and about $1\frac{3}{16}$ inches long. Numerous other varieties have since arisen. The most valuable of these, Sakellaridis or Sakel, has lint about $1\frac{1}{2}$ inches long and much lighter in color than that of Ashmuni. Egyptian cottons, which constitute about 6 per cent of the world's crop, are greatly in demand among manufacturers of fine cottons. They are used largely for fancy dress goods, sewing thread, and fabrics for automobile tires and airplane wings.

Each of the varieties developed successively in Egypt appears to have originated with the selection by some cotton grower of a superior individual plant, the seed of which was increased and finally planted on a field scale. Formerly, few precautions were taken to keep the different varieties apart, and their uniformity was soon lost as a result of cross-pollination in the field and mixing of seeds at the gins. The work of selection and seed increase has been taken over recently by Government experts, and large supplies of relatively pure seed are now available for planting.

Seed of one of the Egyptian varieties was introduced into the United States by the Department of Agriculture some 30 years ago, and experimental plantings were made in various localities. The results showed that this kind of cotton grows best in the hotter parts of Arizona and California, where the climate is most similar to that of Egypt, and where, as in that country, the crop is grown under irrigation. A superior plant of distinctive type, selected in 1907 from the imported stock in Arizona, was the starting point of a new variety, called Yuma. In 1910 a single plant found growing in a field of Yuma cotton was selected because of its fruitfulness and the excellence of its lint, and from it was developed Pima, the only variety of the Egyptian type now grown commercially in the United States. (Figs. 35 and 38.) The lint of this variety averages about $1\frac{1}{4}$ inches long. (Fig. 36.) The successive stages in the development of Pima cotton from its Egyptian ancestor are shown in Figure 39.

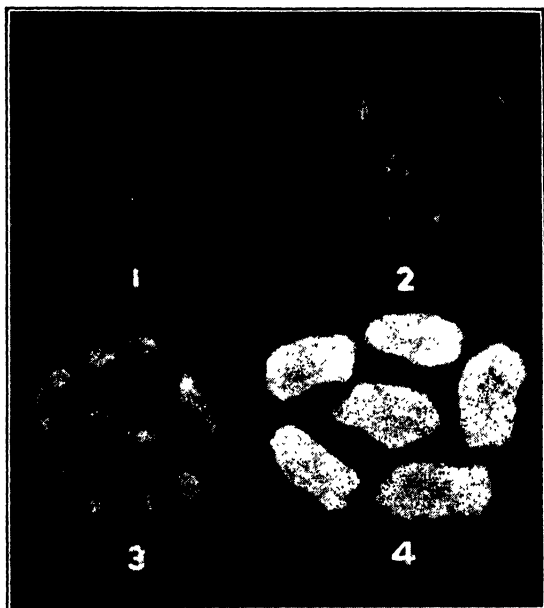


FIGURE 37.—Seeds of various commercial cottons, with lint removed, showing differences in fuzziness. They are: (1) Rough Peruvian with seeds practically naked; (2) Sea Island with fuzz confined to the ends of the seed; (3) Asiatic, seeds covered with short greenish fuzz; and (4) American upland, seeds covered with long white fuzz. (Photograph by R. L. Taylor)

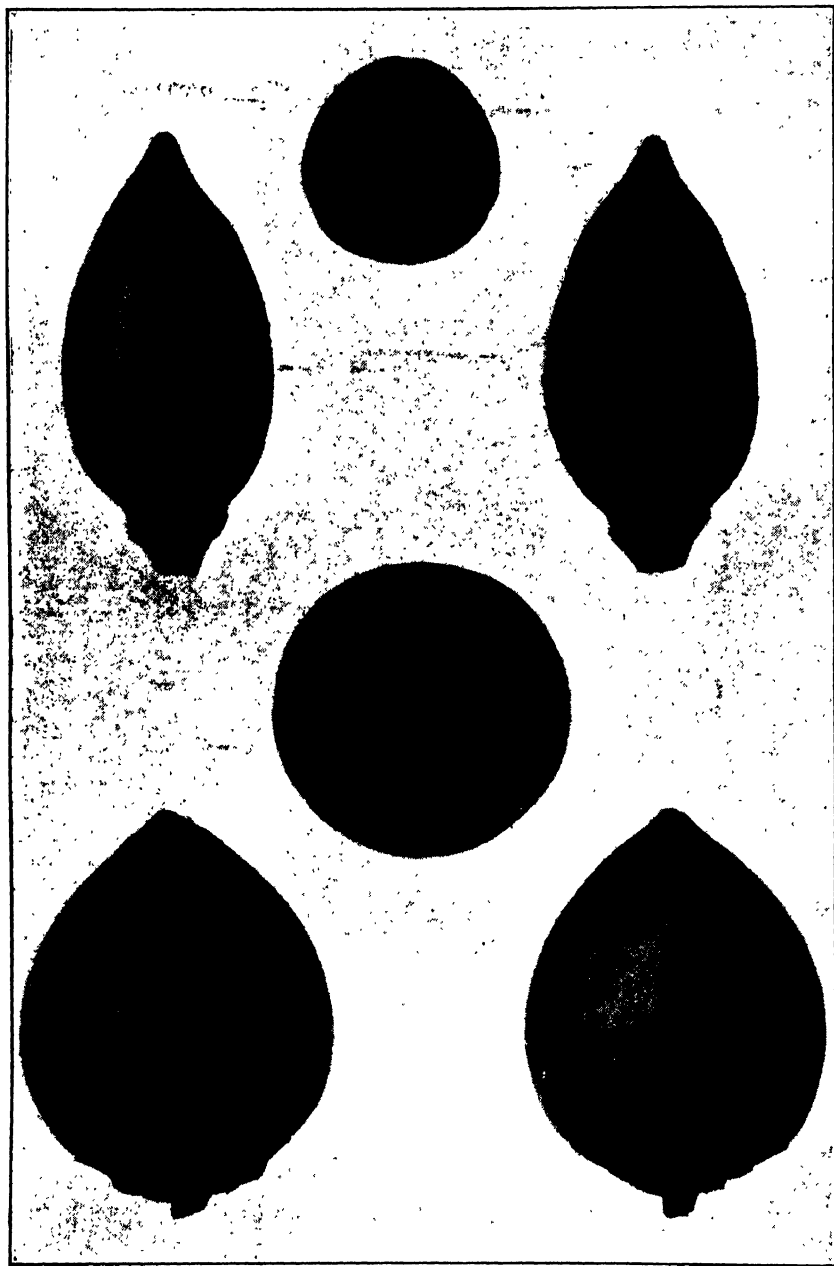


FIGURE 38.—Full-grown but unopen bolls of Acala upland cotton, representative of the Mexican-Central American group (lower), and of Pima Egyptian cotton, representative of the South American group (upper). The bolls of the first group usually have four or five locks or cells and are larger, much less pointed, and smoother than the bolls of the second group, which are prevaillingly 3-celled. (Natural size.) (Photograph by H. F. Loomis)

Upland Cotton

Although less spectacular than the long-linted Sea Island and Egyptian cottons, upland cottons far outrank all other types in general utility. They constitute almost the entire crop of the United States and at least 60 per cent of the world supply. The original home of upland cotton probably was in Mexico or Central America, since forms similar in character to the cultivated upland varieties are found in that region growing wild or in a state of semidomestication by primitive tribes. History gives no clear indication of when and how these cottons first reached the territory that is now the United States. There is little doubt, however, that at the beginning of the nineteenth century most of the American crop was of the upland type.

Selection by farmers of individual plants which caught their fancy soon gave rise to an enormous number of so-called varieties, many of which differed in little but name. In recent years the agricultural experiment stations of the Southern States and the United States Department of Agriculture, as well as private breeders, have been active in producing new varieties of upland cotton. A list compiled by the Department of Agriculture includes about 1,200 names of varieties, of which some 400 have been added during the last 10 years. The lint of

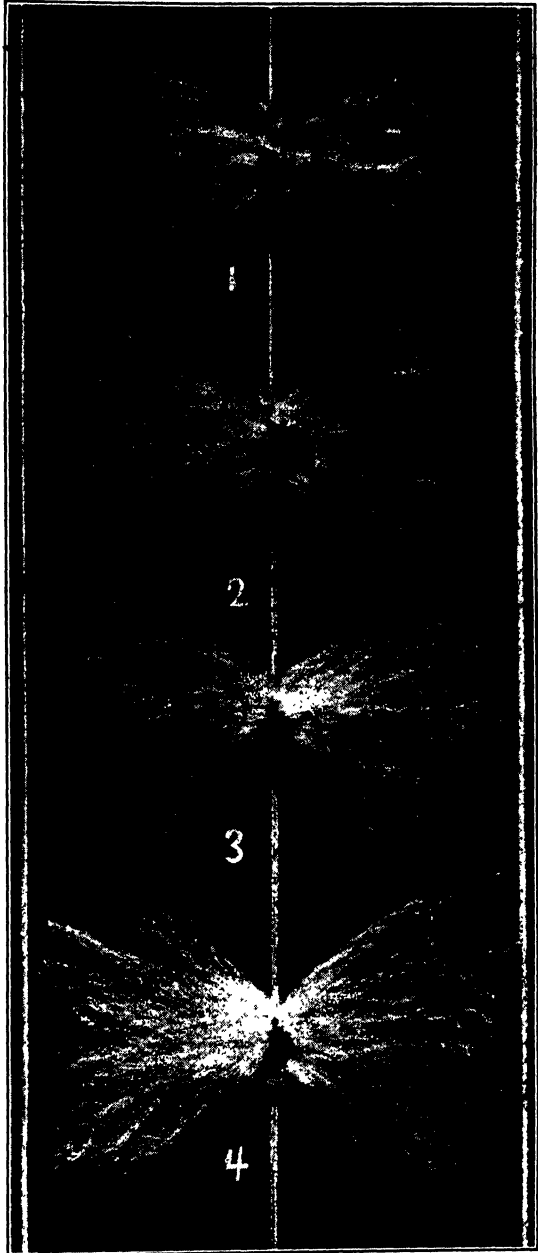


FIGURE 39.—Lint combed out on seeds to show progressive improvement in the staple of Egyptian cotton after introduction into Arizona. (1) Mit Afifi as first introduced from Egypt; (2) the same after several years selection of the longest-linted individuals; (3) Yuma; (4) Pima

upland cottons ranges from about three-fourths inch to $1\frac{1}{8}$ inches in length, with a few "long-staple" varieties producing still longer lint. In one of these, Meade, the length averages $1\frac{1}{8}$ inches and even reaches $1\frac{1}{8}$ inches in special selections.

Several kinds of "big boll" upland cotton have been introduced in late years from Mexico and Central America by the United States Department of Agriculture. When first grown in this country these stocks showed much diversity, but selection of the best individual plants has led to the development of uniform varieties. One of these, Acala, is now the leading upland variety in the irrigated sections from western Texas to California and is grown without irrigation in central Texas and Oklahoma. (Figs. 34 and 38.)

Asiatic Cotton

The great bulk of the cotton produced in Asia is of the Asiatic type, which constitutes about 28 per cent of the total world crop. The lint of most Asiatic cottons is comparatively short and coarse, the staple usually not exceeding three-fourths of an inch. (Fig. 36.) There are numerous varieties, especially in India, where plant breeders in the Government service are engaged in the improvement of the local forms. The work of selection is being carried on also in China, Japan, and Russian Turkestan.

Methods Used by Cotton Breeders

The large and showy flower of the cotton plant is well adapted to both self-fertilization and cross-fertilization. Cotton is self-fertile and will "set" bolls even when the flower buds are inclosed so as to exclude insects, thus permitting pollen to be deposited only by automatic discharge at the base of the stigmas. To the breeder this is a desirable condition, since it enables him to develop uniform varieties by inbreeding. Fertilization is more nearly complete, however, and the yield of seed and lint is greater, when additional pollen is carried to the stigmas by bees and other insects. Most of the pollen deposited by insects comes from the same flower, but some of it is brought from flowers on other plants, resulting in cross-fertilization. The readiness with which the cotton flower can be cross-fertilized makes it possible to combine, by crossing, the best qualities of different forms, but, on the other hand, natural cross-pollination by insects is a constant threat to the uniformity of varieties.

In the improvement of cotton, as of other crop plants, there are two main lines of attack, (1) selection accompanied by inbreeding, and (2) cross-breeding or hybridization. Until lately, simple selection has been the only method used consciously in improving the cotton plant, although doubtless in many cases the plants selected have been natural hybrids. Cotton breeders have directed their efforts mainly to discovering the best individual plants among the mixed stocks which have come down from primitive times and to increasing the seed from such plants in order to establish more uniform varieties.

The method of selection differs only in minor details from that used by breeders of other crop plants. Starting, let us say, with a rather mixed population, such as is found in most fields, the breeder first picks out the individual plants that seem most typical, are most productive, and have the largest bolls and the most desirable habit of growth.

When the bolls open the plants are compared as to abundance of lint and its length, strength, and general quality. The choice thus is narrowed to such of the individuals selected on the basis of plant type as prove also to have superior lint. Seed from each of these individuals is saved and planted separately the year following.

When the progenies of the selected plants are examined the next summer, some of them are likely to show diversity in type of plant. These will be rejected without further consideration because of lack of uniformity. Others, although uniform, will be lacking in fertility or show an undesirable habit of growth. These also will be discarded promptly. In the fall the remaining progenies are compared as to character of lint, and only those that appear satisfactory as a whole are finally retained. The most desirable individuals in these progenies are selected, and their seed is saved for planting the second generation progenies. The process of selecting the best progeny, and the best individual plant in that progeny, is continued year after year until it becomes evident that no further progress is being made; in other words, that uniformity has been attained. Thereafter the problem is one of increasing the seed for planting on a field scale.

Where it is merely a question of improving an existing variety, more rapid progress usually can be made by selecting plants in the most uniform progenies, even though occasional individuals in less uniform progenies have superior lint. This is not to deny that an outstanding individual plant of conspicuous merit, wherever it occurs, should be considered as the possible source of a new and better variety.

Breeder Should Avoid Accidental Crossing

The cotton breeder must use the utmost vigilance to protect his selected stocks from becoming contaminated by accidental crossing with other kinds of cotton. In the breeding nursery the exclusion of pollen-carrying insects is effected by inclosing the flower buds in bags or wiring them before they open and by saving for planting only the seed produced by these strictly self-fertilized flowers. In fields grown for increase of seed, however, the labor and cost of thus treating a sufficient number of flowers would be prohibitive, and the only solution of the problem is to have the field located at a safe distance from any other kind of cotton. As an additional precaution, seed-increase fields should be inspected early in the season, in order to determine whether any contamination has resulted from accidental crossing the year before. If such proves to be the case, the field should be "rogued," which means that all plants appearing to be different from the selected type should be pulled up. "Off-type" plants, usually of a degenerate character, appear occasionally in inbred families, even when every conceivable precaution has been taken to protect them against accidental cross-pollination. Since the occurrence of such "rogues" can not be guarded against, it is obvious that even the most carefully isolated strain of cotton should be kept under close observation and rogued whenever necessary.

Heretofore, the deliberate creation of new types of cotton has scarcely been attempted, but interest is awakening in the possibilities of guarded cross-pollination as a means of getting new combinations of desirable characters. There is good reason to expect that this method will prove fruitful, especially when the forms to be crossed are not too distantly related. The cotton flower, because of its large size and the

accessibility of its reproductive parts, is easy to cross-pollinate. This is done by opening the bud and removing the stamens the evening before the flower is due to open naturally, thus preventing self-fertilization. The emasculated bud is then bagged to keep out insects, and the following morning its stigmas are dusted with pollen from the plant selected as the other parent of the cross.

Experience has shown that when crosses are made between two varieties of the same type, Egyptian, for example, it is possible to obtain a blend of the best qualities of both parents. The resulting new variety can be rendered "fixed" and uniform by selection in a few generations. But when very distinct types of cotton, such as upland and Egyptian, are crossed, an entirely different condition is encountered. After the first generation the hybrid plants show immense diversity in all their characters and the great majority are unproductive or otherwise undesirable.

Reorganization of Cotton Production

The ancient Greek fable of the man who was condemned eternally to trundle a stone uphill only to see it come rolling down again aptly characterizes the work of the cotton breeder. Numberless excellent varieties have been originated in the breeding nursery, but, when placed in the hands of farmers, they have soon deteriorated and have had to be replaced by new ones. It came to be believed that some unknown law of nature determined the length of life of a variety of cotton and that it was bound to "run out," automatically, within a few years. There is, however, no real evidence that a variety can not be maintained indefinitely if the planting seed is kept pure.

Recently a beginning has been made in reorganizing cotton production on the basis of one-variety communities. This system was proposed by O. F. Cook as a means of avoiding the loss of uniformity due to cross-pollination in the field and mixing of seed at public gins, which occurs wherever two or more varieties are grown in the same neighborhood. If the system were generally adopted, the breeder of cotton would be inspired to redouble his efforts, since he might hope to see his creations perpetuated until replaced by something better, instead of disappearing a very few years after they begin to be grown agriculturally.

T. H. KEARNEY,

Principal Physiologist, Bureau of Plant Industry.

COTTON Fabrics are the Most Suitable for Children's Wear. There are no fabrics so suitable for children's wear as cotton. Variety of weave, texture, weight, and color makes it possible to use cotton for practically all

garments from underwear to out-of-door play suits.

A happy child is one who is allowed to have free and unrestricted play. Silks, velvets, and fancy woollens are not intended for little folks who make mud pies and climb fences that have stray nails. They are made for the grown-ups. Children must have fabrics that are durable, comfortable, not easily wrinkled, resistant to dust, easily laundered, and never so expensive that an accidental tear becomes a crime. One can afford several outfits when cottons are chosen, and it is possible to have the frequent changes needed for comfort, cleanli-

ness, and health. Besides, those inevitable catastrophies are never so serious when a fresh supply of suits and dresses is always at hand. Play that is hampered by fancy clothes or a limited number of outfits robs a child of a part of his birthright which contributes to physical development and happiness.

The Bureau of Home Economics has designed several outfits for children such as rompers, sun suits, little girls' dresses, suits for the



FIGURE 40.—Cotton is the ideal fabric for the small boy as well as the girl

small boy, and out-of-door play suits. Cottons are used for practically all of these, not only because of the low expense, but because they are so well adapted to childhood needs.

Fabrics must be selected with use in mind. Cottons adapted to little girls' dress-up frocks would be entirely out of place for little boys' suits. A 1-year-old who is ready to wear his first rompers needs firm fabrics that have a smooth soft texture, light weight, durability, and fast

color. They must stand the wear and tear of scooting over the floor, and this means frequent tubbings that might well be called scrubblings. The new high-count chambray, gingham, and broadcloths are durable; the smooth, close weave does not gather so much dirt; the colors are reasonably fast; the textures are comfortable for tender skins; and the firm weave makes it unnecessary to use starch. This does away with the scratchy seams that had to be endured by children of former years.

The sun suit has now come to be an accepted part of the summer wardrobe of the young child. Soft, open-weave materials such as marquisette and cable net make excellent tops because they admit the health-giving rays of the sun; and lawn, percale, gingham, poplin, and broadcloth may be used to complete the suits. These fabrics are fast to sunlight so that a child is free to play in strong light as long as he wishes without danger of having a faded suit.

Materials for Play Dresses

Little girls enjoy play dresses when they are fashioned from gaily printed lawn, gingham, and percale. The soft dainty texture of these fabrics makes them especially comfortable and adaptable to the designs which must always have fullness for free play. Dress-up frocks are attractive and practical when made of dotted Swiss, dimity, lawn, batiste, and voile. The daintiness of color and weave makes excessive trim unnecessary, and only enough to emphasize the beauty of the fabric is in good taste. Simple stitchery of color-fast cotton strand floss, bias binding, or contrasting fabric is usually sufficient. The fabric determines the trim.

Sturdier types of cotton satisfy the active small boys who must climb trees and turn somersaults. Many mothers have a mistaken fashion sense and dress their small lads in fragile fabrics that are not made for rough play. This is hard on a real boy and likely to prove costly. For hygienic reasons too, washable suits give most satisfaction the year round, and extra warmth can be provided by heavier underwear. Heavy cottons that are closely woven such as madras, gabardine, and galatea may be used for winter suits. In summer, blouses are comfortable if made of lightweight gingham that harmonize with trousers of the new fine-ribbed piqué, poplin, or broadcloth. These fabrics have body enough to tailor neatly yet they are soft in texture.

Shower-proof and closely woven cottons are good for out-of-door play suits when the air is damp or cool. They may even be used as coveralls for the warm woolen suits needed for the freezing days when snowballs fly.

CLARICE L. SCOTT,

Assistant Clothing Specialist, Bureau of Home Economics.

COTTON-GIN Fires
Frequent; Chief Cause
Is Static Electricity

An earnest effort has been made in recent years to develop some method of reducing the heavy fire losses in cotton gins. Some insurance companies have refused to carry insurance on cotton gins; others have limited the amount for which they will be liable; and in all cases the rates have been increased. Even with greatly increased rates the money paid on

claims in some sections has amounted to 500 per cent of the premiums collected. Any reduction in the fire loss which will result in lower insurance rates or make possible the carrying of additional insurance will benefit directly the cotton ginner and cotton grower. The tabulated data for the 5-year period from 1923 to 1927, as compiled by the National Board of Fire Underwriters, indicate an average annual payment of \$2,078,606 on 1,584 claims against insurance companies. This figure is particularly significant in view of the small value of the average gin plant. No figures are available to indicate the losses from fires in uninsured gins or the claims paid by mutual insurance companies, but the amount of such losses would undoubtedly greatly increase the total.

In the statistics of the National Board of Fire Underwriters referred to, one-half of the total number of fires were ascribed to two of the known causes, namely, friction or sparks occasioned by running machinery, and smoking or matches. Eighty per cent of the remainder were listed as unknown. Undoubtedly, static electricity, included in the classification friction or sparks occasioned by running machinery, is the principal cause of fires during the ginning process.

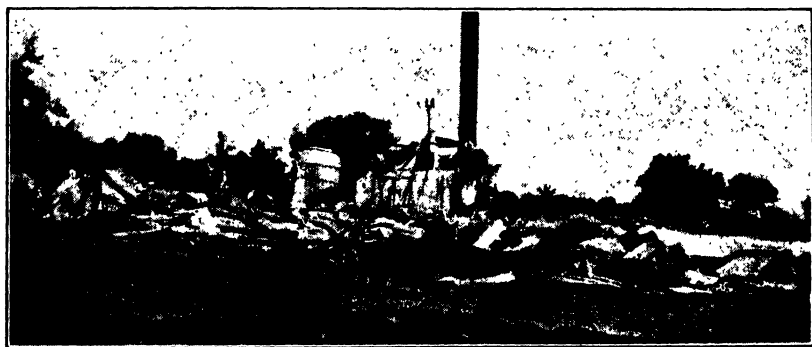


FIGURE 41.— One of the hundreds of cotton gins annually destroyed by fire

Conditions Producing Static Electricity

In seasons when the largest number of fires in cotton gins have occurred, electrostatic charges have been abundant and troublesome. At such times the humidity was low, and cotton being ginned was particularly dry and dirty. During the periods when few fires occurred very little static electricity could be detected.

When humidity is low and cotton is both dry and dirty high charges of static electricity are common in the unloading and distributing systems, cleaners, and lint flues, and on saw and brush shafts, and practically all belts. These three conditions—low humidity, dry cotton, and dirty cotton—are essential for high electrostatic charges in the gin.

For the elimination of static electricity in cotton gins the grounding of machinery, as shown and described in United States Department of Agriculture Circular 76 C is recommended.

Fire-Packed Gin Bales

Fire-packed gin bales, that is, bales into which has passed some burning cotton ignited during the ginning process, cause serious losses.

It is recommended that immediately after a fire, the ginner plainly and conspicuously mark the bale that is tied out, regardless of the known or supposed condition of the bale. Some authorities suggest that these bales be identified by a red tag on which the month and day of ginning, as well as the gin is shown. This identification will serve as a warning to the compress yard weigher, the warehouseman, or the railroad agent that such a bale is a suspicious one and may contain fire. Bales so identified should be set aside where they will not endanger property or other cotton.

There has been considerable criticism, undoubtedly justified, of the general condition of the average American bale of cotton with respect to the fire hazard. It would seem that increasing the density of the bale, reducing its tendency to expand, and using a more closely woven burlap and more ties, would materially reduce the fire hazard in so far as the communication to and spread of fire among bales is concerned.

Fire Protection

In addition to the installation of a properly designed wiring system to eliminate static electricity and the precautions which should be taken to prevent smoking and the carrying of matches about a gin, adequate fire protection in a gin is of great importance. If a fire can be fought in its incipency it can be readily put out, and little damage will result.

Fire-protection equipment in a gin may consist of water barrels, tanks, pumps, and pails; hose and standpipe connections to a water-pressure system; chemical extinguishers; and steam jets into gin stands, lint flue, cleaner, and pneumatic distributor. Interest is being shown in the use of carbon-dioxide gas as a substitute for steam for fighting cotton-gin fires, especially since internal-combustion engines and electric motors appear to be supplanting the steam engine as a source of power in ginning. Systems using carbon-dioxide or other inert gases have been developed for fire protection in other industries, and it may be possible to adapt this method of fire protection to cotton gins.

Cost of Inert Gas-Production Systems High

The principal objection to such installations at the present time is the cost of the equipment. To provide complete protection against fire in the lint flue at all times while the gin is running would require from 4,000 to 5,000 cubic feet of carbon-dioxide per minute in the average 4-stand gin. Unless a large supply of carbon-dioxide is readily obtainable near the gin at a low cost, protection of this type is not practical. Carbon-dioxide stored under pressure in steel tanks is available, with arrangements for releasing this gas automatically when a fire occurs. Since a number of fires may occur at a gin within a few hours a large reserve supply of gas is necessary to provide protection while any used tanks are being replaced. A 50 cent reduction in the insurance rate is allowed for such installations, and when the value of a plant or the amount of insurance carried justifies the expenditure the use of inert gas should be considered. The cost of an installation will vary according to the size of the plant.

Cotton-gin manufacturers are endeavoring to cut down the fire losses by constructing the machinery of metal as far as possible. The results are encouraging, and if the cotton ginner will install such equipment

in a metal building grounded to remove static electricity and take the necessary steps to maintain a clean plant and prevent smoking on the premises cotton-gin fire losses can be decidedly reduced.

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Engineer,

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COTTON Grade and Staple Estimates Show Quality Trend

Public records have been kept since 1790 showing the number and the weights of the bales of cotton produced each year, but there have been no complete public figures showing the grade and staple of the cotton produced or consumed. In 1928, for the first time in the history of the industry, comprehensive figures were published showing the grade, staple, and tenderability of the cotton on hand at the end of the cotton year, July 31, and also for that year's crop. Figures were also published showing the number of bales of each grade and staple consumed by domestic mills during the preceding cotton year.

Quality is important to both growers and spinners. The cotton grower wishes to produce the cotton that will return to him the greatest net revenue. In the past, he has lacked information both as to the quality of the cotton he and other farmers were growing, and as to the grades and staples required by the spinners.

Spinners desire for use in their mills specific grades and staples, depending on the counts of yarn and the quality of the goods to be produced. This is especially true with respect to length of staple, because only within limits can one staple length be substituted for another. For certain uses, longer staples sometimes may be substituted for shorter, but it is not generally economical to do so. Staple length is, therefore, of special interest to the spinner.

Legislation Passed in 1927

In response to the demand for this information Congress, in 1927, passed legislation directing the Department of Agriculture to make an estimate of the grades and staple lengths of cotton carried over on August 1 of each year, and of the cotton as ginned during each crop year. Funds were made available for the fiscal year beginning July 1, 1928.

In carrying out the purposes of this measure, a representative portion of the 2,500,000 bales of cotton reported by the Bureau of the Census as on hand July 31, 1928, was classified according to the official cotton standards of the United States, and from this an estimate was made of the grade and staple length of all of the cotton reported as on hand. From these figures the number of bales tenderable on future contracts was calculated.

Of a total of 2,540,000 bales of cotton carried over to the next season, American upland constituted 2,400,000 bales, or a little over 95 per cent. Of these, all but 220,000 bales were tenderable on future contracts in accordance with section 5 of the United States cotton futures act.

More than 26 per cent of the American upland cotton in the carry-over was 1 and $1\frac{1}{2}$ inches in staple length. The next most abundant

staple length was seven-eighths inch. The cotton was over more than twice as much cotton $1\frac{1}{8}$ inches or longer as of that which was shorter than seven-eighths inch.

The foreign cotton carried over in largest quantity was Egyptian, of which there were 65,000 bales. There were 45,000 bales of all other foreign cottons. The carry-over included practically no foreign cotton seven-eighths inch to $1\frac{1}{8}$ inches, the lengths produced in greatest abundance in the United States.

Estimates Released Periodically

Estimates of the grade and staple of cotton produced in the United States and in the several States were released periodically during the ginning season for the crop of 1928. These estimates were based on data obtained by the classification of samples secured from gins (fig. 42) distributed throughout the Cotton Belt in a manner calculated to give a cross section of the periodic ginnings of the crop.

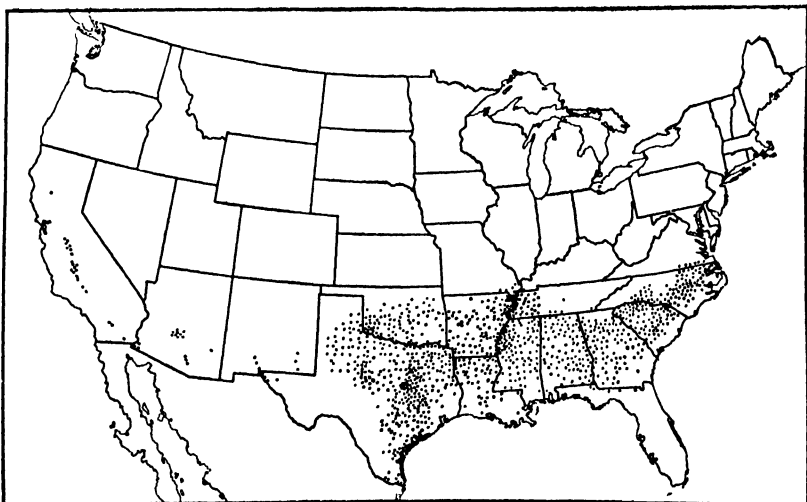


FIGURE 42.—Distribution of cooperating gins. Each dot represents a gin which cooperated by furnishing a sample of each bale ginned during the crop year 1928-29

American upland constituted all of the 14,290,000 running bales reported by the Bureau of the Census as having been ginned up to March 20, 1929, with the exception of 28,000 bales which were American Egyptian. In round numbers, 12,000,000 bales, or 86 per cent of the 1928 crop, were graded as White or Extra White and a little over 6,900,000 bales, or 48 per cent, were better than Middling in grade. The grade produced in the greatest abundance was Strict Middling, over 5,000,000 bales having been classified in this one grade. Only about 3 per cent, or about 490,000 bales, was untenderable on future contracts because of grade, although 1,790,000 bales were untenderable because the staple length was below seven-eighths inch, the shortest length tenderable under the law.

Preferred Lengths in the United States

In proportion to the quantity available, cotton 1 to $1\frac{1}{2}$ inches appears to have been a preferred staple length in the United States,

while the staple lengths apparently least desired are those shorter than seven-eighths inch. Last year's crop of American cotton, however, showed a production of almost 500,000 bales more of these very short staple lengths than of the lengths around 1 inch.

Although the supply of cotton in 1928 (fig. 43), that is to say, the total of cotton carried over on August 1 and of the crop of 1928, showed a preponderance of short staple lengths, it indicated a large supply of grades better than middling.

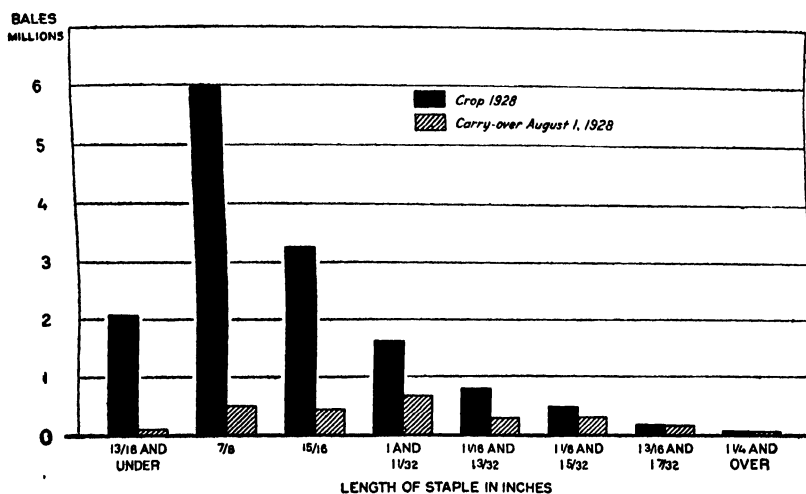


FIGURE 43.—Supply of American upland cotton in the United States, by staple length, 1928-29. The total supply of American upland cotton consists of that on hand at the beginning of the crop year, August 1, plus the current crop

Definite conclusions can not be drawn from data gathered in a single season, but the statistical picture of the quality of American cotton produced each year is of interest, and, together with similar reports covering the quality of cotton consumed in American mills, should be of increasing value as the data accumulate.

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COTTON Insect Control Measures Should Fit Into the Farm Scheme

To appreciate the insect problems involved in cotton production in the United States, it must be remembered that the cotton crop is produced over a region extending 2,000 miles from east to west and 600 miles from north to south. Within this region we find almost every conceivable type of climate, soil, and other conditions influencing the activity of insects. Temperature and rainfall are especially important in their influence on insect activity and it will be noted that the areas of cotton production range from the irrigated districts, with a rainfall of 10 inches or less a year, to other districts of extreme humidity with a yearly rainfall of approximately 60 inches. Consequently the insect problems vary tremendously in different sections and are further complicated by the effect of other crops from which some pests transfer

their attention to cotton. Some sections may have little or no insect damage; others may be afflicted with only one predominant pest; while still others suffer from a complication of overlapping injury caused by a half dozen or more of different pests.

As has been the case with most other crops, the insects attacking cotton have steadily increased in recent years and have already reached the point where in most parts of the Cotton Belt they are a dominant factor in the problem of production. In many sections they have already revolutionized cultural methods and affected land values, and in some cases have completely changed the economic structure of the community. These changes are still under way, and one of the principal problems of the cotton farmer to-day is that of fitting the various insect-control measures into his scheme of farming so that he may reap the maximum benefit from them with a minimum of cost and disruption of his regular farm practices. Fortunately, fairly effective control measures are available for most of the principal pests and these are being improved constantly. However, they require more or less expenditure of money and particularly demand a greater degree of supervision and intelligent planning of farm operations than was the case before these insects became so prevalent and injurious. Insects, as a whole, have served to place a premium on good farm practices that tend to increase the yield of cotton in the absence of insects, since the cost per acre of insect control is practically the same regardless of the productiveness of the crop in question. Therefore the most profitable solution consists of insect control combined with increased production per acre.

Any attempt to deal with even the major pests of cotton in a comprehensive way is beyond the scope of the present article, and in the following pages only some of the more important problems are considered.

The Boll Weevil

By far the most important pest of cotton is, of course, the boll weevil, which entered this country from Mexico more than 35 years ago and now covers more than 90 per cent of the cotton area. Fortunately, the boll weevil thrives only in fairly moist regions, so there are many sections where the weevils either can not survive at all or are able to live only in limited numbers and do practically no damage to the crop. The extent of the damage in the United States as a whole can be seen from Table 2.

TABLE 2.—*Boll weevil damage to cotton in the United States, as estimated by the Bureau of Agricultural Economics, 1910-1928*

| Year | Annual loss of cotton (in terms of weighted average percentage of the estimated crop in absence of the boll weevil) | Year | Annual loss of cotton (in terms of weighted average percentage of the estimated crop in absence of the boll weevil) | Year | Annual loss of cotton (in terms of weighted average percentage of the estimated crop in absence of the boll weevil) | Year | Annual loss of cotton (in terms of weighted average percentage of the estimated crop in absence of the boll weevil) |
|-----------|---|-----------|---|-----------|---|-----------|---|
| 1910..... | 5.30 | 1915..... | 9.93 | 1920..... | 19.95 | 1925..... | 3.87 |
| 1911..... | 1.28 | 1916..... | 13.36 | 1921..... | 30.98 | 1926..... | 7.04 |
| 1912..... | 3.26 | 1917..... | 9.34 | 1922..... | 24.17 | 1927..... | 18.50 |
| 1913..... | 6.69 | 1918..... | 5.83 | 1923..... | 19.55 | 1928..... | 14.10 |
| 1914..... | 5.91 | 1919..... | 13.20 | 1924..... | 8.01 | | |

It should be noted in considering this table that during the years 1910 to 1920 the weevils were still spreading across the Cotton Belt and it was not until the end of this period that they had reached their maximum extent of infestation. Consequently, the figures since 1920 are more significant than the earlier ones and represent the annual fluctuation in damage as influenced by seasonal climatic conditions. Generally speaking, a dry summer means light weevil damage and a wet summer means heavy loss due to weevils. Indirect control measures have been evolved, all tending to increase the productiveness of the crop and hasten maturity of as much cotton as possible before the weevils become abundant. In addition, the use of calcium-arsenate dust has now become very widespread and is an effective and profitable means of control, especially under the conditions of most heavy infestation. While dusting has been practiced commercially for a number of years, it is still in the developmental stage, and improved methods are increasing its effectiveness and decreasing its cost from year to year.

The Cotton Leaf Worm

Probably the oldest known pest of cotton in the United States is the cotton leaf worm, or so-called cotton caterpillar, which has been recorded as occasionally damaging cotton since the earliest days of its production in this country. This species is peculiar in that it does not pass the entire year in the United States. It is active here during the summer months and dies out during the winter, and the infestations are due to reinvasion by moths coming in from either Central or South America. For many years these invasions occurred in approximately 21-year cycles, but something has happened to upset the conditions influencing these cycles and invasions have been intermittent and much more frequent during the past decade.

These invasions are usually characterized by infestations starting along the Gulf coast of southern Texas, some time during the early or midseason period, and then spreading over more or less of the remainder of the Cotton Belt as the season progresses. The degree of damage depends entirely on the rapidity of spread and abundance of the worms. Fortunately, these worms are very readily controlled by poisoning, but the greatest problem lies in forecasting outbreaks long enough in advance to permit growers to secure an adequate supply of poison and machinery for applying it in the threatened districts, since damage develops very rapidly once an infestation appears and the poison applications frequently must be made within a few days after the first worms are noticed.

This cotton leaf-worm problem is assuming an entirely new aspect owing to the extensive use of poison in the Gulf coast region of Texas where the first individuals usually land. Much of this territory is now treated with poison practically every year for boll-weevil control and this same poisoning likewise serves to control the leaf worm. In addition there are now available for service several companies doing airplane dusting in that territory, and when a leaf-worm infestation starts, they are able to treat large areas on comparatively short notice. In 1929, for example, infestation started in southern Texas earlier than in any previous season for which there is a record, and normally at least the greater part of Texas and a portion of Louisiana would have been infested by the end of the third generation. During that season, however, poisoning for these worms was so general in the area infested

by the initial invasion that the spread was greatly retarded and comparatively few counties were infested at the time of maturity of the crop in that region. This crop maturity, however, was accompanied by rainy weather which permitted leaf-worm multiplication, and as a result the next two generations spread very rapidly, reaching at least as far eastward as Mississippi. Fortunately, most of this spread arrived after the crop was fairly well matured and thus caused little or no loss. But for the extensive poisoning practiced in southern Texas during the early months, these worms would have spread to the north and east through the adjoining States from one to two months earlier than they did.

The Cotton Bollworm

The cotton bollworm, or corn ear worm, is another old pest of cotton. It occurs throughout the Cotton Belt but causes severe injury, as a rule, only in Texas and Oklahoma. Even in those States its damage is very sporadic, though the tendency during the last few years, especially in central Texas, has been toward an increase in damage, possibly due to changed farm practices. Through most of the Cotton Belt this pest always takes a small share of the crop, but usually not enough to warrant an effort at direct control. Furthermore, even in the areas of greatest damage, the erratic occurrence of the outbreaks has always rendered control very difficult. The farmer suffering severe loss one year may take all precautions for control the next year and then find practically no worms in his crop. Control measures are usually associated with cultural practices, though cases of extreme infestation have warranted direct control by poisoning. The increased severity of damage during recent years has rendered it necessary for the Department of Agriculture to undertake a review of control measures in conjunction with present farm practices in the effort to reduce the losses.

The Cotton Louse

The cotton louse or aphid occurs throughout the Cotton Belt but is usually not looked upon as a major pest. During a period of cool nights in the early spring the infestation on seedling cotton may become severe enough to cause some loss of stand and retardation of growth of the surviving plants, but the damage is seldom sufficient to justify any effort at control. Damage to older cotton has usually been rather rare until within comparatively recent years. During the last decade or more there has apparently been a rather definite trend toward increased abundance, especially in dry seasons. This is further complicated by the fact that the use of calcium-arsenate dust for boll-weevil control is occasionally accompanied by increased louse infestation. Consequently there has been a steady growth of interest in control measures, although it has been found that even comparatively severe louse infestations on cotton during the late seasons caused relatively little loss of crop. Control can be readily secured by the use of nicotine dust when necessary, and where weevil poisoning is being practiced, control of the two pests is accomplished by the addition of nicotine to the calcium arsenate.

The Cotton Flea Hopper and Related Species

The most important cotton insect development of recent years has been the spread of "flea-hopper" damage over the Cotton Belt.

This was first recognized about 10 years ago in southern Texas but did not attract general attention until 1926, when it served to retard greatly the setting of fruit over most of the Gulf States and extended as far eastward as South Carolina. This problem is still under investigation; it has been found, however, that the damage is caused by any one of several insects occurring in different sections of the Cotton Belt, and in some localities two or three different species may collaborate to produce the damage. The exact nature of the injury is still unknown; it results primarily in the shedding of the young fruit of the plants and extreme deformity of the vegetative growth. The problem is a very complicated one, involving as it does a number of different species of insects having different life cycles, and is also influenced by the seasonal history of the different alternate host plants found in various sections. So far, the best results in cases of severe infestation have come from the use of sulphur dust applied to the plants in much the same manner as calcium arsenate is used for the boll weevil. Fortunately, this damage usually does not continue throughout the season and a good crop of cotton may still be produced after the hopper damage has ceased, provided the other insect pests have not become so abundant that they prevent the setting of fruit. Hopper damage is therefore of primary importance in its relation to the activity of other insects which may increase in abundance, during the period when the hoppers are preventing the setting of fruit, to the point where they will in turn prevent the setting of fruit after the hoppers have ceased their activity.

Other Less Widespread Insects

In addition to the foregoing major pests, there are numerous others of more or less localized importance.

The Arizona wild-cotton weevil, for example, a very close relative of the boll weevil, is found occurring in the mountain ranges of Arizona and northern Mexico on *Thurberia*, a native wild-cotton plant. A few years ago this weevil transferred its attention to some of the near-by plantings of cultivated cotton and since that time a constant fight has been in progress to prevent the further spread of this species. This pest is primarily a menace to the western areas of cotton production where conditions have been too dry for the ordinary boll weevil to thrive but where this species seems to multiply without difficulty.

The cotton leaf perforator is known to occur in California and eastward as far as southern Texas, principally in the irrigated districts. This is another case where the outbreaks are very sporadic, and so far severe damage has occurred only in the Imperial Valley of southern California.

The red spider of cotton has attracted attention mainly in the Southeastern States, but occasionally, especially after periods of prolonged drought, it causes considerable damage as far west as the Mississippi Valley. Fortunately this pest is comparatively easily controlled by cleaning up other host plants and by applying sulphur.

Practically every season alarming reports come in from some districts of the Cotton Belt regarding activities of the cotton square borer, but this insect usually causes much more alarm than actual damage, as natural control by other insects practically always eliminates it as a factor just when it appears to be most threatening.

The cotton farmer of to-day can not possibly ignore the problem of insect control in his production program, and the most profitable crops of cotton can only be expected when he has made intelligent application of the best known control measures to his particular set of insect problems.

B. R. COAD,

COTTON of Long Staple Could be Produced in Much Greater Quantity

A greatly increased production of long-staple cottons is possible in the United States to meet the requirements of new developments in the West, where the highest possible combination of material are required. The rapid growth of the West calls for a home production of high-staple cotton from Egypt and other sources, which is inadequate and precarious, and we take advantage of the large importations of essential raw materials from the West to produce if suitable adjustments of the tariff can be made.

Superior varieties of long-staple upland cotton are now available, as early and productive as varieties with less than an inch staple. Such varieties are now replacing the older, late-maturing, "Peeler" varieties formerly grown in the Yazoo Delta and neighboring regions of Mississippi, Louisiana, and Texas, and can be produced in many other districts. Probably 2,000,000 to 3,000,000 bales could be supplied, with staple from $1\frac{1}{2}$ to $1\frac{3}{4}$ inches, if the uses of such cotton were developed. All of the field operations—preparing, planting, and cultivating—are the same for growing inferior cotton as for producing good fiber. The popular notion that high yields are to be obtained only from varieties with very short staple is incorrect.

Sea Island and Egyptian Long Staples

The finest long staple in the world, some of it 2 inches or more in length, was produced formerly in South Carolina, on the Sea Islands near Charleston, which also supplied seed to Georgia and Florida. A total production of 100,000 bales of Sea Island cotton was attained in favorable seasons before the weevil period. Experiments are now being made to determine the possibility of reestablishing the production of this cotton in South Carolina and neighboring States in separate communities, away from upland cotton.

A limited production of the Pima variety of Egyptian cotton has continued in the Salt River Valley of Arizona since 1912. The crop of 1928 was about 30,000 bales, while 200,000 to 300,000 bales of Eryp-

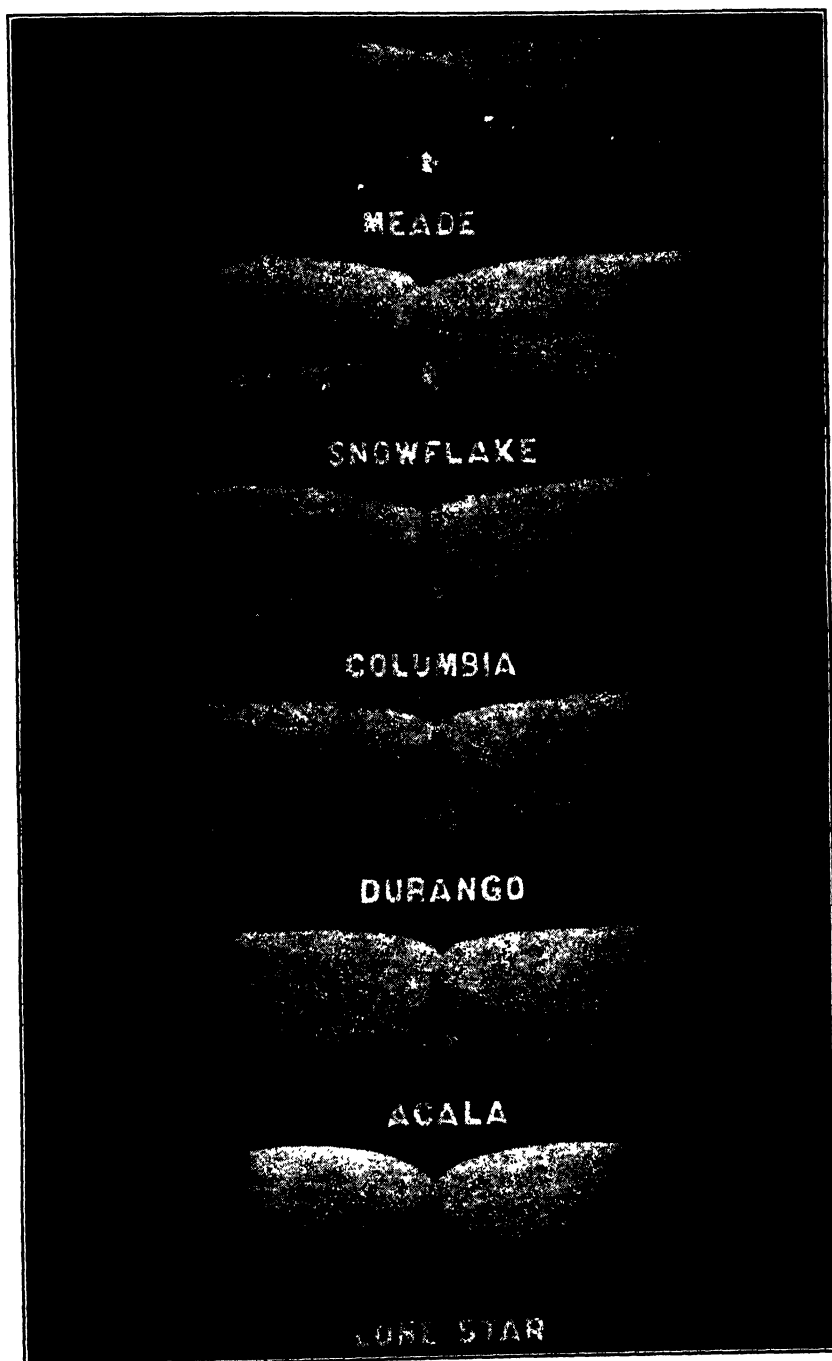


FIGURE 44.—Combed samples of premium and long-staple upland cottons produced in the United States. (Natural size)



FIGURE 45.—Combed samples of extra-long staple cottons produced in the United States.
(Natural size)

tian cotton were imported. A half million bales of Egyptian and Sea Island cotton probably could be grown and used in the United States if production and marketing could be stabilized.

Medium-length upland staples, from $1\frac{1}{8}$ to $1\frac{1}{4}$ inches, can be grown over a large part of the Cotton Belt under any conditions where the plants have regular supplies of moisture. The nature of the soil determines very largely the rainfall requirements or the frequency of irrigation. Favorable and unfavorable soil conditions may be found in the same neighborhood, or even in parts of the same field, which render the fiber very irregular, unless precautions are taken for separate handling of the cotton from the good and bad areas.

Poor Fiber a Cause of Loss

The lives of millions of people in the United States are applied to producing, manufacturing, and selling cotton, and all of these activities are less effective because the fiber is inferior; and the consuming public has less satisfaction. The wastes from using poor fiber are enormous. The improvement of the staple is the key to the general improvement of the industry.

The commercial system undoubtedly is responsible for the limited production of fiber of good quality in the United States. Efforts to improve the quality of the cotton fiber are seriously handicapped by the methods of buying the cotton from the farmers at "flat prices," without adequate discrimination of quality in the primary markets.

Statistics collected recently by the Bureau of Agricultural Economics indicate that 79 per cent of the crop of American upland cotton in 1928 was under 1 inch in length, while less than 5 per cent

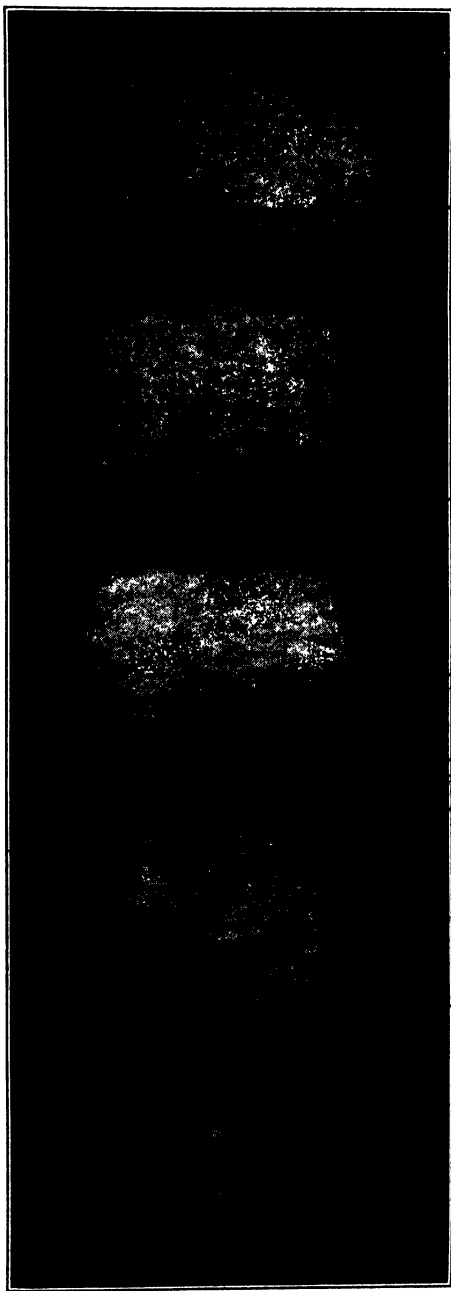


FIGURE 46.—Pulled samples of extra staple cotton, same series of varieties as in Figure 45. (Natural size)

attained $1\frac{1}{8}$ and less than 1 per cent $1\frac{1}{4}$ inches. Nearly 18 per cent of the crop, or 2,500,000 bales, was not tenderable in the futures market on account of the fiber being less than seven-eighths of an inch in length. Thus the disregard of quality has been carried to an extreme, and the fiber in many districts has declined to a footing of competition with the shortest and cheapest cottons, from India and China. Markets for good cotton are not supplied, while a large surplus of inferior cotton must be carried over. In the last few seasons millions of dollars have been lost in loans to producers of inferior fiber, so that bankers and financial leaders are beginning to see the need of being interested in the quality of the seed that their clients plant. Subsidizing the incompetent farmers does not make for improvement of production.



FIGURE 47.—Experimental field of Sea Island cotton, Wadmalaw Island, near Charleston, S. C., August, 1929

Community Production of Long Staples

Cooperative marketing is considered to afford the best outlook to the solution of the general problem of placing farm life on a footing of economic equality with urban activities, and in the cotton industry the cooperative relations should begin with the improvement of production. The best outlook for developing a sustained and successful production of long-staple cotton seems to be in organized progressive communities where marketing improvements can be applied as well as improvements of production. Farmers do not become interested in improved varieties and methods except as the better quality of the fiber is reflected in a higher price. Improvements of production and of the commercial system must go together, since there is little prospect that either undertaking can be carried forward without the other; but both lines of improvement are combined naturally and constructively in communities that unite upon the growing of a single superior variety.

The primary advantage in growing one variety exclusively is that the selection and isolation of the seed stocks can be maintained and all of the farmers of the community supplied with seed of the same high quality. Cultural methods are improved because it is plain in 1-variety communities that differences in the behavior of the crop are due to conditions of growth, not to differences in varieties. A farmer whose crop is poor learns to correct his mistakes instead of relying on the false notion of "changing the seed." The next crop is placed on better land or grown more carefully, and the community product is gradually made more uniform.

A continued production of the same quality of fiber places a community in a few years on a different footing in the marketing of its cotton. Competent buyers are attracted to the communities that produce commercial quantities of good fiber, and manufacturers are interested in obtaining regular supplies of the same cotton from year to year. Premiums that manufacturers have paid for the longer staples have fluctuated greatly in the past, chiefly on account of the limited and irregular supplies. The experiment of a properly adjusted production and use of long staples has never been tried, and is one of the problems that may be worked out by cooperative contacts between associations of manufacturers and communities of growers.

Conscious Community Interest Necessary

A cooperative relation is established among the members of a community by the planting of a single variety of cotton; but a conscious community interest must exist, as well as a desire to grow better cotton, if the 1-variety community is to function as a constructive organization and obtain the full advantage of growing better fiber. Cooperation has its problems that need to be studied, no less than tillage, cultivation, and seed breeding. One writer has said that cooperation is the seed of community life. This applies especially to the cotton industry, because community cooperation is required for the basic improvement of production through maintaining supplies of pure seed.

O. F. COOK,

Principal Botanist, Bureau of Plant Industry.

CREAM-Gathering Routes for Local Creameries Coming Into Wider Use

Cream-gathering routes for local creameries have been used to some extent for many years. Since the motor truck has come into general use and country roads have been improved, this method of getting cream from the farms to the creamery is being more widely adopted.

A study made by the Bureau of Dairy Industry of cream-gathering routes revealed that at some plants the advantages of this method of hauling greatly outweigh the disadvantages, while at others the reverse is true. Where the producers bring sweet cream direct from the farms to the creamery, deterioration in quality in transit usually is very slight. Employing trucks to gather cream would cause much of it to be en route a longer time, with the result that the cream would be of poorer quality when it arrived at the creamery. On the other hand, where the producers bring their cream to the creamery only

once or twice a week as suits their convenience, the use of trucks to gather it three or four times a week will result in the creamery receiving a better-quality product. At some creameries the establishment of cream-gathering routes has resulted in improving the quality of the butter to such an extent that the increased price received for it more than paid the cost of gathering the cream.

Where cream is bought according to grade, cream-gathering routes may enable more patrons to deliver first-grade cream. In order that each patron's cream may be weighed, sampled, and graded after arrival at the creamery, the cream should be delivered in the patrons' cans.

By using cream-gathering routes the creamery management controls the day of delivery, the time of delivery, and the care of the cream while in transit. By having large loads of cream arrive at certain hours, the receiving and processing of the cream can be done more efficiently than when producers are delivering cream at all hours of the day. Cream-gathering routes may also increase the volume of cream procured by the creamery. New patrons may be obtained in near-by sections because of the service given them, and in more distant communities by extending the routes.

Creamery Management Should Control Details

All details of operating cream-gathering routes should be controlled entirely by the creamery management. In some communities persons not employed by the creamery have organized their own cream routes and fixed their own charges for hauling. Where this is done undesirable features usually develop. Cream haulers compete with one another for the same cream, they may invade the territory of a neighboring creamery and thus cause strife, or they may divert their load of cream to another creamery. These things can not occur where the routes are planned by the creamery management and the haulers are hired to cover a definite route.

The selection of suitable haulers is important because they become the creamery's point of contact with the producers. A conscientious hauler of good personality with the interest of the creamery at heart can aid in establishing among the producers confidence in the creamery management.

The main factor that determines whether or not it is advisable for a creamery to establish cream-gathering routes is cost. As cream is paid for on a basis of its butterfat content, the hauling cost is best expressed as the cost per pound of butterfat. When a producer hauls his cream to a creamery and attends to other business on the same trip, the cost of transporting the cream is small. When trips are made exclusively for carrying cream the cost of hauling is likely to be greater than the cost of delivery by cream-gathering routes. The cost per pound of butterfat of operating a cream-gathering route can be estimated quite closely by obtaining the following data: Number of miles to be traveled, pounds of butterfat to be obtained, wage rate for truck drivers, and cost per mile of operating the truck. This last item can be obtained from the manufacturer of the truck to be used. If the cost of hauling is \$10 per trip and only 100 pounds of butterfat can be obtained the cost will be 10 cents per pound of butterfat, which is more

than the service is worth either to the producer or to the creamery. If, however, 500 pounds of butterfat were obtained on this trip, the cost would be but 2 cents per pound of butterfat, which is less than the cost to the average producer when he makes a special trip to deliver his cream. In a study of cream hauling by the Bureau of Dairy Industry at 8 middle-western creameries the relationship between the cost of hauling and the number of pounds of butterfat obtained per mile was determined, as shown in Table 3.

TABLE 3.—Data on cream hauling obtained at eight middle-western creameries

| Creamery No. | Average patrons per trip | Average miles per trip | Quantity of butterfat hauled per trip | Average distance between patrons | Average butterfat per patron | Average butterfat collected per mile traveled | Cost per pound of butterfat |
|--------------|--------------------------|------------------------|---------------------------------------|----------------------------------|------------------------------|---|-----------------------------|
| | <i>Number</i> | <i>Number</i> | <i>Pounds</i> | <i>Miles</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Cents</i> |
| 1..... | 33.7 | 41.7 | 280 | 1.23 | 8.3 | 6.7 | 2.66 |
| 2..... | 40.2 | 37.4 | 340 | .93 | 8.5 | 9.1 | 2.41 |
| 3..... | 39.4 | 35.5 | 327 | .90 | 8.3 | 9.2 | 2.05 |
| 4..... | 56.5 | 53.1 | 464 | .94 | 8.2 | 8.9 | 2.18 |
| 5..... | 44.7 | 36.9 | 645 | .82 | 14.4 | 17.7 | 1.08 |
| 6..... | 26.2 | 19.9 | 418 | .76 | 16.0 | 20.9 | 1.05 |
| 7..... | 21.5 | 23.5 | 205 | 1.09 | 9.5 | 8.7 | 2.20 |
| 8..... | 29.0 | 28.1 | 227 | .97 | 7.8 | 8.1 | 1.83 |
| Average..... | 36.6 | 34.7 | 377 | .95 | 10.3 | 10.88 | 1.72 |

It is obvious that the cost of hauling would be relatively high in a section having patrons far apart and owning but few cows, thus producing but a small amount of butterfat per mile.

Employment of Truck Owners Proves Cheapest Method

Of the eight plants listed in Table 3, three owned the trucks used on the routes and hired drivers by the month. The remaining five employed men who owned trucks and paid these men, in a few cases, by the trip, but usually according to the pounds of butterfat hauled. It has been the experience of many plants that cream may be gathered at the least expense by employing men who own trucks to cover routes laid out by the creamery management.

Short routes are preferable to long ones because of the shorter length of time the cream is in transit. In order to have short routes and to arrange that all the cream reaches the plant early in the day, cream gathering provides employment for only a part of the day. Many creameries, therefore, employ farmers as cream haulers. A farmer living at some distance from the creamery can gather the cream in the territory between his farm and the creamery, deliver it, and then return to his work on the farm. Creameries operating their own trucks usually arrange their routes to provide full-time employment for trucks and drivers. The operation of a number of trucks by a creamery demands as careful managerial supervision as the operation of the creamery.

C. S. TRIMBLE,
Associate Dairy Manufacturing Specialist,
Bureau of Dairy Industry.

CREAM Grading Enables Creameries to Improve Quality of Their Butter

A cooperative creamery in a Southern State had been in operation for several years before an effort was made to get the farmers to care for their cream and deliver it frequently. The same price per pound of butterfat was paid for all cream regardless of age, acidity, or degree of fermentation. Although the best manufacturing methods were used the butter was always of low grade, consequently the price paid for butterfat was low.

Upon the advice of State and Federal dairy specialists a program of cream improvement was adopted. For several months methods of cooling and caring for cream and of cleaning dairy utensils were explained to farmers at the creamery, at schoolhouse meetings, and at their homes. A cream-cooling tank was set up outside the creamery as a continuous demonstration of how the farmers should cool and store their cream. Each patron's cream was occasionally scored and criticized and a copy of the score card sent to him.

Grading System Established

All of this was but preliminary to establishing a grading system and paying for cream according to grade, which became effective in the spring of 1925. Three grades of cream were adopted, as follows: Premium cream, containing not to exceed 0.2 per cent acid and clean in flavor; grade 1 cream, containing 0.21 to 0.4 per cent acid and clean in flavor; grade 2 cream, containing more than 0.4 per cent acid or having undesirable flavor. The price for butterfat in premium and grade 1 cream was fixed at 3 cents a pound higher than that in grade 2. The effect of this price differential on the quality of cream received at the creamery is shown in Table 4.

TABLE 4.—Percentage of premium and grade 1 cream received at creamery as result of price differential for butterfat

| Year | Premium and grade 1 cream received | Year | Premium and grade 1 cream received |
|-----------|------------------------------------|-----------|------------------------------------|
| | <i>Per cent</i> | | <i>Per cent</i> |
| 1923..... | 0.00 | 1926..... | 66.26 |
| 1924..... | 10.00 | 1927..... | 65.06 |
| 1925..... | 62.67 | 1928..... | 70.30 |

Not only was the quantity of premium and grade 1 cream increased but the quality of all other cream was so greatly improved that the butter made from the grade 2 cream is now of better quality than the entire output before grading was started.

The improvement in the quality of cream has naturally resulted in higher prices for the butter, as shown by Table 5.

TABLE 5.—Difference between price per pound for 90 score centralized car lots of butter in Chicago and that received at the creamery

| Year | Cents | Year | Cents |
|-----------|-------|-----------|-------|
| 1923..... | -2.88 | 1926..... | -0.50 |
| 1924..... | -1.90 | 1927..... | -.58 |
| 1925..... | -.41 | 1928..... | +1.16 |

In 1928 this creamery received 3.04 cents per pound more for its butter, in relation to the market price, than in 1923, before cream grading was adopted. As the creamery in 1928 made 181,900 pounds

of butter, it received \$5,529.76 more than it would have received if the butter had been of the same quality as that made in 1923.

Butter Quality Materially Improved

Another creamery, located in the same section of the State and making about 300,000 pounds of butter per year, is following the leadership of its neighbor, with the result that about one-third of its cream is premium and grade 1, and the quality of its butter has been materially improved.

In a near-by county a cooperative creamery was established in 1928 and started grading January 1, 1929, using the same grades and price difference as mentioned above. Although this had always been sour-cream territory, that creamery received as much as 50 per cent premium and grade 1 cream during the spring of 1929.

These are examples of effective methods of improving the quality of creamery butter. Many creameries that are now manufacturing low-grade butter can make a material improvement in quality by adopting a grading system and paying for cream on a basis of the grade of butter that can be made from it.

WILLIAM WHITE,
*Senior Dairy Manufacturing Specialist,
Bureau of Dairy Industry.*

DAIRY and Beef Cows' Udders Differ; Skeleton and Other Organs Similar One glance at a dairy cow and a beef cow reveals great differences in their conformation. These differences have been emphasized so often that the tendency has been to imply that they are greater than can be accounted for by the difference in fleshing and that they must extend to the anatomical and skeletal structure of the animal. Not long ago, Sophie Nineteenth, of Hood Farm, a Jersey cow which at one time held the world's yearly record of production of butterfat, and Blackbird of Dallas, an Aberdeen Angus cow that had been successful in show-ring competition, were obtained and slaughtered for the purpose of determining the fundamental differences between the two types. Their external conformation, internal anatomy, mammary development, and skeletal structure were studied in detail.

In order to determine the differences in external conformation, it was necessary to make body measurements. In addition to the body measurements, which were taken with calipers and tape line, cross-section outlines, or contours, of the fore chest and paunch were made for both cows. (Figs. 48 and 49.) Contours are much more significant than caliper measurements of the same body parts because one cow may have exactly the same depth and width as another yet, because of differences in outline, the two cows may differ greatly in contour. A striking difference between the two cows is shown by these contours. The contour area of the fore chest of Blackbird was more than twice that of Sophie and the area of the paunch was more than one and one-half times as much.

Although Sophie weighed 638 pounds less than Blackbird at the time measurements were obtained, she was more than 6 centimeters taller at the withers, of almost the same height at hips, and more than 2 centimeters lower at the pin bones. The total length of Blackbird from withers to pin bones was 95.8 per cent as great as that of Sophie. The three body circumferences showed greater size for Blackbird. Sophie

had a longer but narrower head. In proportion to her width, she also was much deeper than Blackbird in the fore chest and slightly deeper in the paunch. The volume of barrel was about 70 per cent greater and the body-surface area about 20 per cent greater for Blackbird, whereas the legginess, or proportion of leg length to total height, was about 15 per cent greater for Sophie.

BOVINE CONTOURS

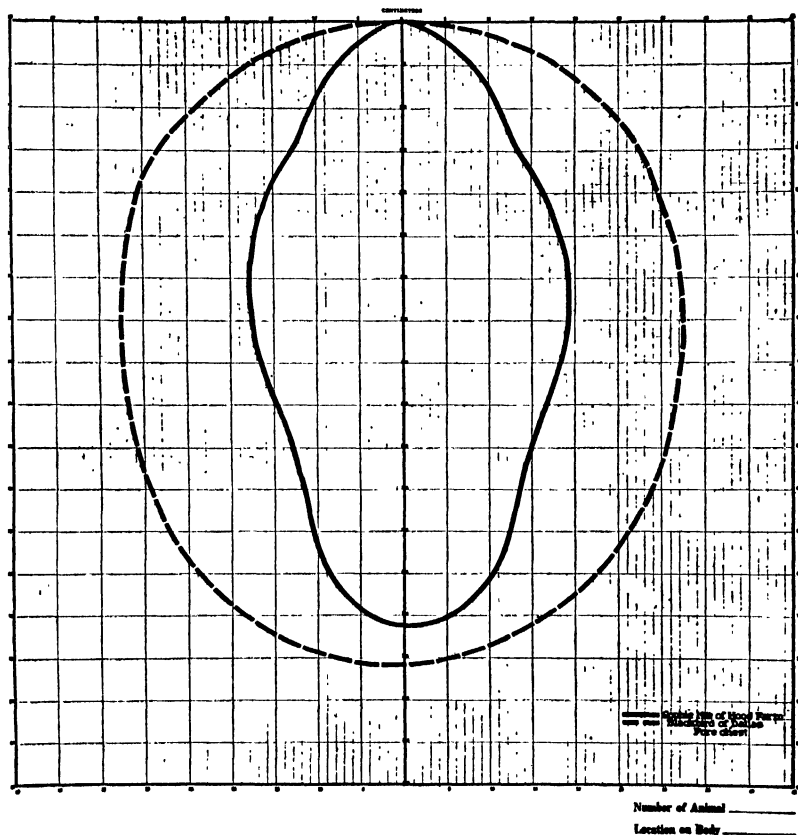


FIGURE 48.—Contours of fore chests of Sophie and Blackbird

Differences In Tapering

The body measurements and contours consistently show that Sophie was decidedly tapering laterally from front to rear but that she had almost equal depth of fore chest and paunch. Blackbird, on the contrary, did not taper very much laterally from front to rear but she did show a decidedly greater depth in paunch than in fore chest. It is somewhat contrary to one's expectations to find a greater vertical wedge shape in a beef cow than in a dairy cow.

Although the differences in conformation were great, the organs of the two cows were similar in size. The weights of kidneys and adrenals were greater for Blackbird than for Sophie. The spleen weights were almost identical. The weights of empty stomachs and empty intestines were less for Blackbird than for Sophie. Intestine lengths of

166.5 feet for Sophie and 181.71 feet for Blackbird are of interest because of their relative similarity and because these values are intermediate and do not even approach the maximum or the minimum intestine lengths recorded in the post-mortem study of a large number of cows. An accurate weight of Sophie's lungs could not be obtained because of blood retention. Blackbird's lungs weighed 5.85 pounds, which is relatively low on the basis of the average lung weights of 229 cows slaughtered in a packing house. The heart weights were almost identical and the heart circumferences were similar. The weight of

BOVINE CONTOURS

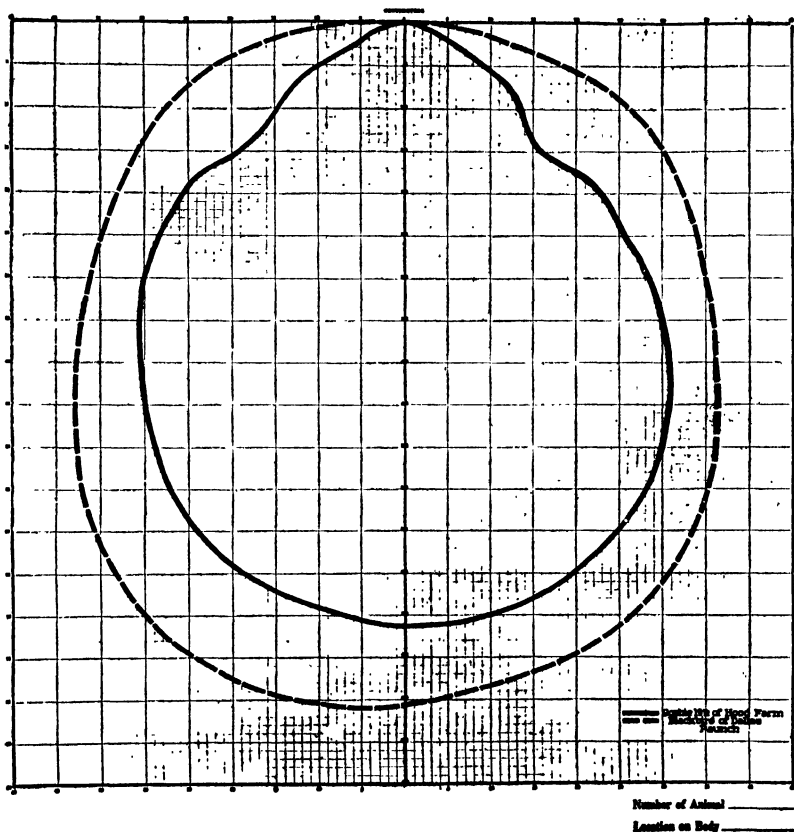


FIGURE 49.—Contours of paunches of Sophie and Blackbird

each was about one-half pound less than the average heart weight obtained in the study of more than 200 cows in a packing house. The weight of thyroid was much greater for Blackbird than for Sophie. This can be attributed largely to interlaying of fat in the thyroid of Blackbird. In general, the differences in size of organs are not sufficiently great to indicate significant differences in function.

After the skeletons were cleaned and assembled they were measured in detail. Contours similar to those made on the living animals were prepared. In the fore chest the skeleton of Sophie is narrower and deeper than that of Blackbird. The contour or cross-section areas,

however, are almost exactly the same. What Sophie's skeleton lacks in width is made up in depth. The contours of the upper part of the paunch also show less width but greater depth for Sophie. The areas, however, were similar for the two cows. Again, the lack of arch of ribs in Sophie's skeleton is much more than made up in depth of body.

Skeletons Markedly Similar

Caliper measurements of the skeletons show that Blackbird is slightly wider in the fore chest, narrower in the rear chest, and of



FIGURE 50.—Vertical transverse section through the rear quarters of Sophie's udder

the same maximum width of paunch. Blackbird is consistently more shallow in skeletal structure and has less vertical wedge shape than Sophie. The two skeletons exhibit almost exactly the same degree of wedge shape laterally. These conditions are greatly in contrast to their external conformation, which showed a distinctly greater vertical wedge for Blackbird and a much greater lateral wedge for Sophie.

Judges of dairy cattle are inclined to attach considerable importance to the openness of conformation or the width of spaces between ribs, spinous processes, and vertebræ, believing that such openness allows more space for nerves to pass out through the spine from the spinal cord. The canals through which the nerves and blood vessels pass are called foramina. Some of these canals are formed by notches in the ends of

adjoining vertebræ. Others are present in the form of a distinct hole through the vertebra itself. In these two skeletons the holes through the vertebræ are more numerous than the notches between them. Nerves passing through the holes in the vertebræ could hardly be restricted or otherwise influenced by closeness or openness of conformation. Furthermore, those that appear as notches between the vertebræ are nearly all in the region of the loin, where the distances between spinous processes are not readily determined by examining the living animal. Judgment of the width of spaces between spinous

processes in the living animal, therefore, could hardly be significant of the freedom of passage of nerves from the spinal cord. It appears that the nerves which control the udder pass out between the second and third vertebræ of the loin. At this location the foramina measure 2.55 centimeters for Sophie and 1.68 centimeters for Blackbird. The significance of these diameters may be subject to speculation.

In skeletal structure the two cows are generally similar. This indicates that in the evolution of the dairy and beef types, which has been

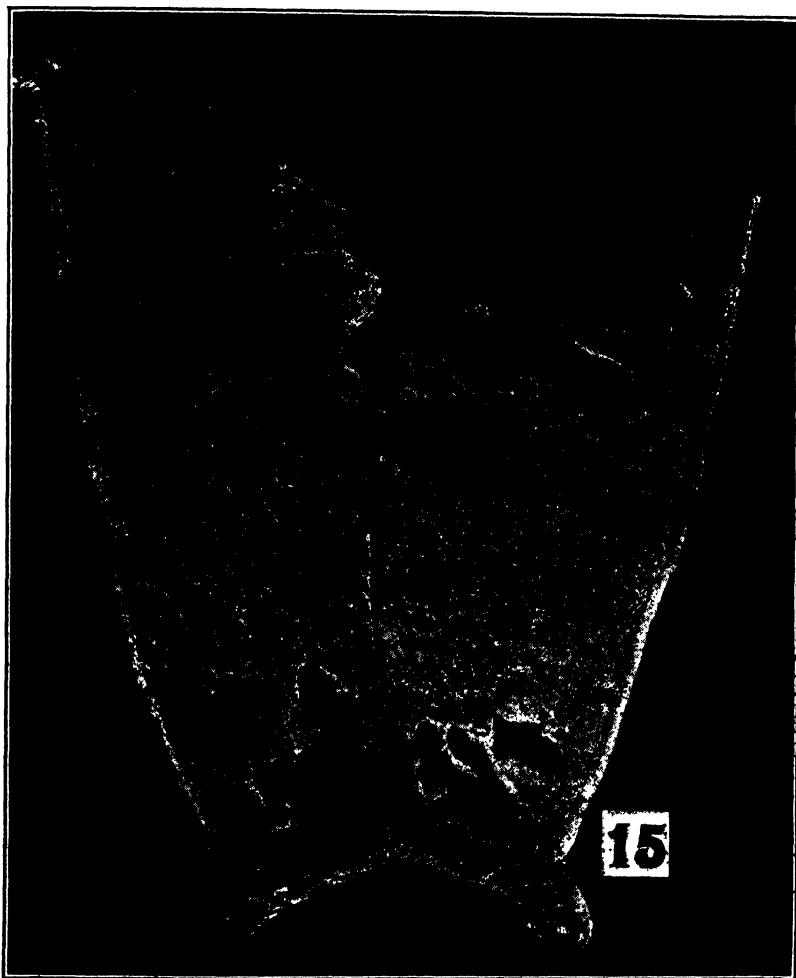


FIGURE 51.—Vertical transverse section through the rear quarter of Blackbird's udder

accomplished through breeding and selection, their skeletal structure has not been materially changed, but rather that the difference in type is due to extreme fleshing of the beef cow and to udder development and absence of fleshing of the dairy cow.

The general appearance of the udders of these two cows was perhaps not more different than that of udders selected at random from cows of two different breeds. The big surprise came when the udders were cut into cross-section slices. (Figs. 50 and 51.) The udder of Sophie

had gland tissue over practically its entire area in both front and rear quarters. Blackbird's udder, on the contrary, had in the rear quarter an area of gland tissue somewhat irregular in shape, about 5½ inches at its maximum width and surrounded on the top and sides with solid fat. In the front quarter the gland tissue was almost lacking. Obviously, the udder of Blackbird was extremely limited in capacity for milk production. Aside from their external conformation, the most marked difference found between the two cows was in the quantity of secretory tissue in the udders.

W. W. SWETT,

Senior Dairy Husbandman, Bureau of Dairy Industry.

DAIRY Bulls Should be Kept Alive Until Their Value Is Known Previous to January 1, 1929, the Bureau of Dairy Industry proved 635 dairy bulls, mated with cows in dairy-herd-improvement associations, by comparing the yearly production records of five or more unselected daughters of each bull with the yearly production records of their dams. Reports received from the field show that at the time these bulls were proved 100 were alive and 433 were dead. No definite information was obtainable regarding the remainder. Only 100 living bulls out of a total of 635 is not a good record unless it can be shown that only the inferior bulls were disposed of.

In order to determine the relative merits of the 100 living bulls and the 433 dead bulls, the dam and daughter records of the former were compared with those of the latter. Table 6 gives the information obtained.

TABLE 6.—*Comparison of dam and daughter records of 100 living and 433 dead dairy bulls*

| Item | Sires living | Sires dead |
|---|--------------|------------|
| Sires in group.....number..... | 100 | 433 |
| Average butterfat production of daughters.....pounds..... | 408 | 394 |
| Average butterfat production of dams of daughters.....do..... | 373 | 368 |
| Average gain of daughters over dams.....do..... | 35 | 26 |
| | per cent 9.4 | 7.1 |

Table 6 shows that the living bulls increased the production of their daughters over that of the dams of the daughters only slightly more in per cent than did the dead bulls. Of the 100 living proved bulls, 21 actually lowered butterfat production and only about 50 increased it appreciably over that of high-producing dams.

Owners Fail to Discriminate Closely

This study indicates that the owners of dairy bulls do not discriminate closely when sending bulls to the butcher. Many of them keep the inferior bulls until they are proved and send the meritorious bulls to the block. It may seem strange that experienced dairymen will do this. They have no way of knowing the true value of a dairy bull, however, until the records of the daughters prove his value. The only way to make sure of keeping all the meritorious bulls until they are

proved, therefore, is to keep all the bulls until they are proved. The wisest plan for the dairyman to follow is to select young, well-formed bulls on the basis of their pedigree, use them in a limited way until their daughters prove their value, let the butcher have those that do not come up to a set standard, and keep in service only those that have demonstrated their ability to improve their owner's herd.

The following tabulation gives the record of a highly meritorious proved bull that was sent to the butcher before the records of his daughters were available:

| | | |
|---|-------------|-------|
| Daughters..... | number.. | 12 |
| Average yearly butterfat production of daughters..... | pounds.. | 439 |
| Average yearly butterfat production of dams..... | do..... | 331 |
| Gains of daughters over dams..... | {do..... | 108 |
| | {per cent.. | 32. 8 |

This bull was disposed of to prevent inbreeding. He should have been kept in some herd as long as he lived or was fit for service. Had this been done, he might have become the sire of more than 100 high-producing daughters.

The following tabulation gives the record of a bull that was kept alive until proved, though he lowered production in the herd in which he was used. He might have brought improvement in a lower producing herd.

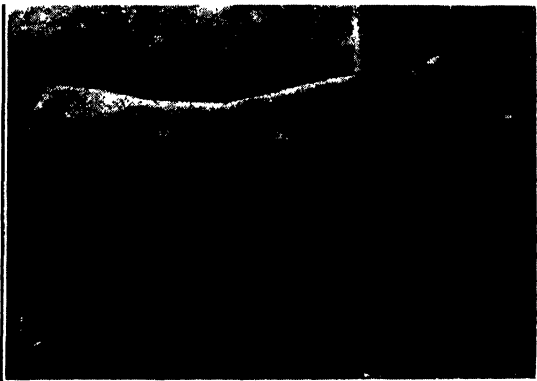


FIGURE 52.—A purebred dairy bull whose daughters greatly exceeded their dams in butterfat production

| | | |
|---|-------------|-------|
| Daughters..... | number.. | 14 |
| Average yearly butterfat production of daughters..... | pounds.. | 328 |
| Average yearly butterfat production of dams..... | do..... | 390 |
| Decrease in daughters' production..... | {do..... | 62 |
| | {per cent.. | 15. 7 |

The following tabulation gives the records of a highly meritorious bull (fig. 52) that was kept alive until the records of his daughters and their dams proved his value:

| | | |
|---|-------------|-----|
| Daughters..... | number.. | 21 |
| Average yearly butterfat production of daughters..... | pounds.. | 524 |
| Average yearly butterfat production of dams..... | do..... | 423 |
| Gain of daughters over dams..... | {do..... | 101 |
| | {per cent.. | 24 |

Production Possibilities That Could Be Realized

If a herd could have at its head a bull like this for a few generations, it would be a leader in average production of butterfat per cow. If a dairy herd improvement association could use sires like this in all its herds for a few generations, that association would lead all others in this country. If a State could use sires like this in all its dairy herds,

it would soon lead the world in average production of butterfat per cow.

Since the value of a bull can not be determined until his daughters' production records are available, every bull worthy to be in the herd at all should be kept alive until proved; otherwise, the proved-sire work is doomed to failure. In order to handle bulls with safety while they are being proved, the well-built modern bull pen, yard, and breeding stall are essential. In some cases an old building may be remodeled and a strong fence built at little expense. Even at present prices for labor and materials the equipment shown in Figure 53 can be built for less than \$300.

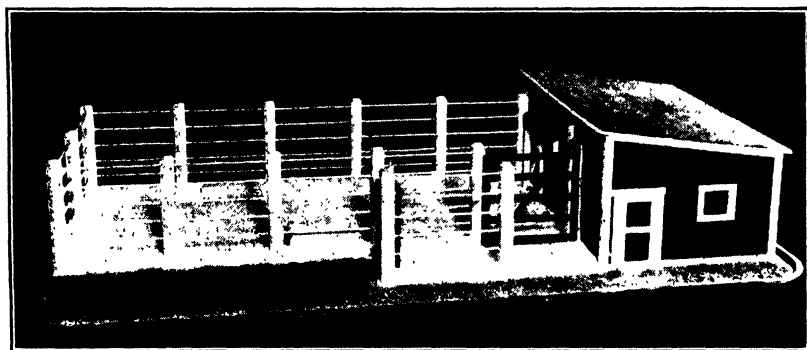


FIGURE 53. —A well-built pen, yard, and breeding stall are essential for the safe handling of the dairy bull

At the present time, through the records of dairy herd improvement associations, 200 to 300 bulls are being proved annually, but most of these are dead. The time is coming when thousands of living purebred meritorious dairy bulls will be proved in a single year. These sires will bring about a great improvement in the dairy herds of this country.

J. C. McDOWELL,

Senior Dairy Husbandman, Bureau of Dairy Industry.

DAIRY Cattle Breeding in Pure Lines Offers Great Possibilities

The genetic make-up of organisms as found in their natural condition of development is largely determined by the reproductive method which is indigenous to the particular species. Propagation in plants and animals is brought about in a variety of ways. Those species which increase in numbers by division of the parent or by offshoots from the parent have very limited facilities for changing their genetic make-up, and variations in these species depend upon mutations or chromosome aberrations; otherwise the offspring are the same as the parent.

In species where succeeding generations are the result of fertilization of the ova of the parent, there are limited or unlimited possibilities for variation depending upon whether the organism is self-fertilized or cross-fertilized. Self-fertilization, as in the case of wheat, is an intense form of inbreeding and results in a homozygous genetic state, or a pure line. There are a number of self-fertilized species of plants, and this reproductive habit has been a boon to the plant breeder as he has in any single seed of such a species the foundation of a pure line.

Those varieties of plants and animals which are normally bisexual reproduce by cross-fertilization. This method results in a population of mixed or heterozygous genetic make-up, as in random matings it is rarely possible that both parents are genetically the same.

The hope of the plant or animal breeder for bringing about improvement in his stock lies in the variations which exist in the population. To proceed intelligently, however, he must first analyze his material. This is best accomplished by close inbreeding, whereby he uncovers the recessive factors which have been masked by their dominant allelomorphs, and also reduces his breeding stock to a homozygous condition.

Gratifying Results With Corn

Corn breeders have pursued this method with gratifying results. Corn is normally cross-fertilized, and the existing populations are extremely heterozygous. By careful self-fertilization for seven generations a condition of 99 per cent homozygosity was reached, which approximates the pure lines existing in naturally self-fertilized species. It is true that production of these pure lines was accompanied by a general loss of vigor as evidenced by greatly reduced size, slow rate of growth, and diminished yield, but all of these factors were fully restored when these pure lines were intermated.

As most species of animals are bisexual, the plant breeders' method of self-fertilization is not available for the animal breeders, and other methods of inbreeding must be resorted to in order to produce pure lines. With insects and small laboratory animals close inbreeding, such as the mating of full brothers and sisters and litter mates, has been extensively practiced for numerous generations. The results have often paralleled those of the plant breeders, and losses of vigor and declines in fecundity have attended this practice, but the increased homozygosity is evident in the offspring, although the rate of approach to the pure line is slower than in artificially self-fertilized plants.

The decline in vigor which accompanies inbreeding is perhaps unjustly attributed to the consanguineous breeding, for it is not the method which causes the diminished vigor, since the causes for the decline were present in the parent stock and inbreeding merely unmasked those undesirable factors. Inbreeding from a parent stock void of these weaknesses would not be attended by detrimental results.

As a means of improving the milk-producing ability of dairy cattle, pure-line breeding offers possibilities which may not be fully appreciated by modern breeders. First of all, where pure-line breeding referred to above included the entire genetic make-up, it is not necessary to make its application to dairy cattle so all-inclusive. The number of factors which control milk production is purely speculative, but that need not be an insurmountable barrier to the application of other known facts to breeding for improved milk production.

In the light of present knowledge two methods are open to the breed improver. Evidence points to the fact that the dairy-cattle population is largely heterozygous, which is true of most species where random mating is largely practiced. It is possible, however to select from this random-bred stock those males which show evidence of transmitting largely the factors for high milk production. This is determined, of course, entirely from the progeny test. If a sire has daughters

which are all capable of greater production than their random-bred dams, it is evident that he is transmitting high production to his progeny.

Best Method Through Inbreeding

The best method of concentrating these high milk-production factors is through inbreeding. Therefore, one way to proceed is to breed the daughters back to their own sire and continue inbreeding as long as the bull remains serviceable. This method carries all the dangers of close inbreeding as there will be concentration of undesirable as well as desirable factors. The principles involved, however, are the same as those in corn breeding, and even if some decline in vigor accompanies this practice, the establishment of two or more lines pure for high milk production would afford material for crossing these pure lines with a restoration of vigor. There would be no possibility for a decline in producing ability, since that is pure in all lines.

If the fear of disaster overshadows the benefits which would follow the development of pure lines by inbreeding, another method can be followed, although the desired result may come more slowly. This method is the continued use for generation after generation of sires which transmit factors for high production. By this method each sire increases the proportion of factors for high production in the herd, and homozygosity is gradually approached. By judicious selection there need be no close relationship between succeeding sires and unless undesirable factors are closely associated with those governing high milk flow, there could be no loss of vigor. The daughters of the first proved sire are bred to a second proved sire, and his daughters in turn are mated to a third proved sire, and so on until the line is pure for high milk production. Instead of inbreeding this method would be classed as outbreeding.

All Animals Profitable in Pure Line

Pure lines of plants breed true, and so a strain of dairy cattle bred pure for high production would all be profitable producers and when intermated their progeny would likewise produce profitably. One great economic loss to the dairy industry is brought about by the necessity of culling from herds the cows which fail to reach a profitable level of production. It is patent that ordinary breeding methods have failed to eliminate this loss. The pure-line method of breeding will result in a race of dairy cows all capable of profitable production and will further benefit the breeders by greatly raising the average production level of all cows.

M. H. FOHRMAN,

Senior Dairy Husbandman, Bureau of Dairy Industry.

DAIRY Cows When Dry Can Be Wintered on Legume Silage Alone Because of repeated failures at the Ardmore, S. Dak., field station in making either a satisfactory pasture or hay from sweetclover, it was decided to place this crop in a silo. Although sweetclover as a pasture crop grew fairly well under the dry-land conditions at this station, it has been difficult, and even impossible with some cows, to force them to graze the pasture. The reason for this is its extremely bitter taste,

which is probably due to the high coumarin content. This extreme condition has not been encountered at the other stations of the bureau. Sweetclover hay has also been made; and although the bitter taste was not so apparent, the hay shattered badly and was not palatable.

In 1928, about 25 tons of white sweetclover were placed in a silo. When cut on June 28, it was about $3\frac{1}{2}$ feet high and just coming into bloom. The moisture content was approximately 60 per cent, and no water was added. Corn silage from the previous year was blown into the silo at the rate of 1 ton of corn silage to 20 tons of sweetclover. This was thought desirable in order to furnish additional carbohydrates for better fermentation. The resulting silage was dark green in color, heavier than corn silage, and had a pungent odor which lessened as the silage aged. It kept excellently, there being practically no spoilage. Apparently the bitter coumarin taste had disappeared.

Four cows, two milking and two dry, were fed this silage. Two of the cows received silage alone; and the other two received, in addition, 3 pounds of oats straw daily for a period of 126 days. The cows did not seem to relish the silage, although when forced to eat it one consumed up to 94 pounds per day. Two of the cows consumed an average of 60 pounds per day for 126 days. One cow refused it entirely after 30 days. The addition of a small quantity of straw to the ration did not materially affect the amount of silage consumed. The cows lost an average of 182 pounds in weight. The production of both milking cows dropped greatly.

Sweetclover Silage as Winter Ration

Sweetclover silage may prove valuable as a wintering ration for dry cows and heifers under dry-land conditions during years when other feed crops fail. Sweetclover can be placed in an inexpensive silo, such as a trench, and be the principal feed for the dry stock through the winter.

At the Huntley, Mont., field station, two milking cows were fed a ration of alfalfa silage and corn silage exclusively for a period of 138 days. In making the alfalfa silage, 1 part of beet molasses was added to each 20 parts of first-cutting alfalfa. The two cows showed a preference for the corn silage at all times. One cow consumed an average of 62 pounds of silage per day for the 138-day period and the other averaged 56 pounds daily. The cows seemed to crave dry feed. They were always more or less gaunt in appearance and lost an average of 190 pounds in weight.

One cow was producing 49 pounds of milk per day when the experiment started. On the fifteenth day her production had dropped to 38 pounds a day. The decrease continued until the forty-seventh day, when she was producing 31 pounds. She continued at this level until the end of the trial. The other cow calved on the seventeenth day after the silage-feeding trial started and produced 34 pounds of milk a day. Her production dropped to 30 pounds and remained at that level until the end of the trial. The decrease in butterfat production between the first and fourth full months on the silage ration was 18.8 per cent for the first cow, and 25 per cent for the second cow.

Results show that alfalfa with a small amount of beet molasses makes a satisfactory silage. This fact should be of considerable importance in localities where the first cutting of hay is coarse, weedy, and unpalatable. Furthermore in many regions legume hays can be

successfully grown, but curing is difficult because of rains or high humidity.

Since cows consume large quantities of legume silage, apparently with no harmful physical effects, when no other feed is given them, it may under certain conditions be feasible to winter dry cows and heifers on legume silage.

An interesting feature of the legume-silage feeding was the inability of the animals to maintain an appetite for large quantities of silage. Many of the cows consumed large quantities for a few days, but invariably the consumption declined after a short time to relatively small quantities.

J. R. DAWSON,

Senior Dairy Husbandman, Bureau of Dairy Industry.

DAIRY Organizations It is estimated that approximately \$40,000,000 are lost each year through producing milk and cream of poor quality. In order to reduce these losses a number of commercial dairy organizations have added quality-control divisions to assist the farmer members in producing milk of better quality.

Studies were made by the Bureau of Dairy Industry of seven of these organizations, which annually assisted more than 55,000 farmers producing over 1,000,000 gallons of milk per day, or nearly 400,000,000 gallons per year. The methods employed by these organizations varied considerably. One organization made routine inspection of all its farms about twice a year. Another inspected about 50 per cent of its farms, visiting monthly those handling grade A milk and about once every three months those handling grade B milk. Field men from one of the large milk companies receiving the milk inspected the other 50 per cent of the farms. One organization made routine inspections of a small number of its farms which were not city inspected. Generally it inspected only those farms producing dirty milk or milk of high bacterial count. Another inspected all farms twice, after which only those having trouble were visited. Still another inspected all farms once, after which only the low-scoring farms and those having trouble were reinspected. The remaining two organizations visited only those farms having trouble.

Routine Laboratory Tests Made

Five of the associations made routine laboratory tests of each shipper's milk. Only one of these employed a special laboratory force for making analyses. In the other four the laboratory tests were made by the inspectors, who had had training along this line. One of the two organizations making no laboratory tests at the time of study was planning to make microscopic counts of bacteria in the near future. All the organizations making laboratory analyses also made sediment tests of the milk.

One association used the methylene-blue test to determine quality; the others used the Breed microscopic count for estimating the number of bacteria in the milk. Plate counts were also made by one or

ganization on all grade A milk; and they were also made occasionally by another organization, chiefly on plant samples.

The number of men employed in this work varied from 2 to 69, depending on the size of the organization and the intensiveness of the work done. Generally, the men spent their entire time on this work, but in several of the associations they did other things, such as obtaining new members and subscriptions and testing the milk for butter fat. Of the 69 field men in the one organization, 6 were veterinarians. This organization also employed 16 laboratory workers in addition to the field men. A total of 102 men, not including the laboratory workers, were employed by the seven associations.

The cost of the work per organization varied from approximately \$6,000 to \$280,000 per year. The total cost for all was a little over \$400,000 per year. The cost per farm was about \$7.25 per year, and per gallon of milk about 0.1 cent.

Grading, together with a premium for extra quality or a deduction for poor quality, was employed by most of the associations as an incentive to the farmer to produce better milk.

In one organization the grading was based on the farm and cattle score, which included the sanitary conditions prevailing on the farm, the equipment and methods employed in handling the milk, and the health of the cattle. In the others the grading was based directly on the quality of the milk as shown by the temperature, the number of bacteria, and the sediment.

In four of the organizations all the farmers had an equal chance of obtaining a premium for producing quality milk. In the other three, the number of farmers were limited by the demand for grade A milk and by the necessity of being located in a territory handling grade A milk.

Premiums Paid for Quality Milk

In four cases the premium for quality milk was paid by the milk plants receiving the milk. In one of these the premium varied from 1 to 5 cents per gallon, and in the other three it varied from 15 to 40 cents per hundred pounds. In another instance a premium of 5 cents per hundred pounds of milk was paid by the producers' association. Two organizations deducted 15 to 25 cents per hundred pounds for poor-quality milk.

The general report from the organizations is that paying for milk on the quality basis, either by giving a premium for good quality or by making a deduction for poor quality, has been a great help in getting the members to produce better milk. This is especially true where all the farmers have an equal opportunity to receive a premium for their milk if it is of good quality. Under such conditions they are generally willing to follow suggestions for improving the milk supply, and the inspector or field man becomes a welcome visitor instead of an unwelcome one.

One association had been doing quality-improvement work for about two and a half years. At the end of that time it was decided to pay a small premium for a good-quality milk. The first month only about 25 per cent of its members received the premium; at the end of a year about 75 per cent received it.

No complete record was available from any of the organizations as to what they had accomplished since starting their quality-control

work. That they had accomplished something, however, is shown by the following statements:

One organization reported that in a little over a year the average premium received by its producers for their milk increased from less than 1 cent per gallon to a little over 2 cents per gallon.

Another reported that on the first check-up about 9 per cent of the farms were rated poor; after a little over a year's work only about 5 per cent were in that class.

Still another reported that in 1927 it started rating plants on the basis of the quality of the milk received. That year only 9 of 67 plants had 90 per cent or more of the tests made at their plants grading as excellent or good. In 1928, 23 out of 78 plants were in this class.

L. H. BURGWALD,

Associate Market Milk Specialist, Bureau of Dairy Industry.

DAIRY Production Fluid-milk areas that supply large
Shifting as Urban urban centers of population have been
Milk Demand Grows expanding for many years, and certain
Eastern States that formerly led in the
production of manufactured dairy products are dropping down the list as important manufacturers of such products. They still rank high as dairy States, but their heavy and, in many cases, increased milk production has been more fully utilized in supplying the demand for milk and cream in the large cities.

Such changes have been accepted as normal developments in the Eastern and New England States, but when any of the mid-Western States begin to show marked changes as a result of this same kind of influence, the condition becomes of exceptional interest.

Perhaps the greatest change in the mid-west area is found in Wisconsin, where for many years the great bulk of domestic cheese has been manufactured. Wisconsin reached its highest rank as a producer of cheese about 1926, when 71 per cent of all the cheese manufactured in the United States came from plants in that State. Shortly afterwards, conditions developed that had a marked influence on Wisconsin's cheese production. Although still outranking other States by far, Wisconsin's share of the United States total dropped to approximately 62 per cent in 1928. United States production in 1928 increased substantially over 1927, and was the heaviest on record. This is evidence that other States have gone into cheese production on a larger scale.

For the most part changes in these other States represent new enterprises, particularly in the South, and in States bordering on the South, where the most notable increases have occurred. The official report for 1928 shows cheese production in Arkansas, Georgia, Kentucky, Mississippi, and Texas, where previously it was of no importance. Production in Mississippi in 1928 was 2,333,000 pounds compared with 15,000 pounds the previous year. Production in Texas was nearly 1,000,000 pounds, compared with none the year before.

Indiana increased its cheese production from less than 750,000 pounds to nearly 5,000,000 pounds, and Missouri from 500,000 to nearly 2,500,000 pounds. Kansas's production was 10 times greater in 1928 than in 1927. Idaho and Montana showed substantial gains.

In practically all these States interest in cheese production has been greatly stimulated during recent years. Future developments will

determine how much they may be depended on to take up the slack if Wisconsin shifts still more to other dairy products. The problem in the Southern States seems to be to obtain adequate milk supplies, and to make a quality of cheese equal to Wisconsin cheese.

Two Factors in Wisconsin's Problem

Two important influences may be mentioned among the factors responsible for Wisconsin's relatively changed position in cheese production. First is an increasing demand for fluid milk for Chicago and Wisconsin cities. Certain new requirements by the Chicago Health Department during the past two or three years were responsible for some shift in the territory that supplies Chicago with milk. Increased quantities of Wisconsin milk are now going into Chicago. Chicago milk distributors sought new sources of supply in Wisconsin's cheese and condensery territory because of its proximity and because dairy-men there were used to selling fluid milk. The principal adjustment was that of meeting the sanitary and health requirements of the Chicago Health Department, which included the tuberculin test. Adequate road conditions aided the change, for motor-truck transportation is an important factor in Chicago's daily milk supply.

The second influence was the opening of outlets for sweet cream, through the improvement of handling methods and rail transportation facilities.

During the first eight months of 1929, approximately 85,000 cans (10 gallons each) of sweet cream from Wisconsin were received at New York and Philadelphia alone. This was the equivalent of 425 carloads, and represented approximately 2,750,000 pounds of butterfat. Had the milk represented by this butterfat been made into cheese, it would have amounted to more than 7,000,000 pounds. Receipts at New York during the first eight months in 1929 were almost three times heavier than during the same period in 1928.

These developments in Wisconsin, along with substantial gains in the production of condensed and evaporated milk, have had a noticeable effect upon butter production. In 1920 about 11 per cent of our domestic butter supply was produced in Wisconsin. In 1928 the percentage was only 9.2 per cent. Butter production in the adjoining State of Iowa, however, increased from approximately 10 per cent of the total United States supply in 1920 to 13 per cent in 1928. Minnesota's production increased from 14 per cent to 18 per cent.

Significant shifts in dairy production are occurring in the Pacific Coast States, where butter production has been declining during recent



FIGURE 54.—Successful long-distance shipping has opened new outlets for sweet cream produced in the mid-west

years because of an increased demand for whole milk and sweet cream to supply city trade, ice-cream manufacturers, and condenseries, at better prices than were obtained through outlets for butter making.

L. M. DAVIS,
Senior Marketing Specialist, Bureau of Agricultural Economics.

DIET in Town and Country Compared in General Survey From city people you often hear the statement, "If you really want good food you have to go back to the farm to get it." Then follows a list of the delicacies which are supposed to appear every day on the farmer's table—fried chicken, thick rich cream, luscious fruits fresh from tree or vine, and vegetables straight from the garden. In sharp contrast come warnings from teachers of nutrition who say that farm families are likely to neglect some of the foods most important from a dietary viewpoint, and that all too often the farm diet consists largely of bread, potatoes, and fresh or cured pork. It has even been asserted that it is easier for a family to be properly nourished in the city than in the country since fresh fruits and vegetables are to be found in great variety all the year round in city markets.

Such conflicting statements leave one wondering what is the truth about the diets of the farm and city families. Some figures which throw light on the question are now available from careful studies that have been made of the food consumed by American families. From them we find that, on the average, the food consumed on the farm yields more energy, calcium, and phosphorus, and about the same amount of protein and iron as that consumed in the city. Energy is used up in the business of living, working, and playing, and must therefore be supplied by our food in amounts adequate to replace that which is burned up to keep these processes going. Calcium, phosphorus, and iron are minerals necessary to keep the human machine operating smoothly. Furthermore, these minerals, together with protein, are essential for normal growth and repair of broken-down tissues.

In addition to these food constituents, there is another group of nutrients which must be taken into consideration in the comparison of diets, namely, the six vitamins. It is not possible to state with any accuracy the amount of vitamins available in the foods, but it is possible to estimate them by determining the importance in the diet of the foodstuffs rich in these factors. The foods that are especially good sources of vitamins are the dairy products, fruits, and vegetables. They are also valuable sources of calcium and phosphorus. Iron is derived largely from meat, eggs, vegetables, and whole-grain cereals, and protein from meat, eggs, milk, and cereals. All foods yield energy, but the best source is fats, sweets, and cereals.

Milk Consumption Greater on Farm

In terms of energy yielded by the food consumed, the two groups of families, urban and rural, use comparable amounts of meat, eggs, fish, fats, and sweets. But milk consumption is almost twice as great on the farm, and cereal consumption is 25 per cent higher in the city. More potatoes are consumed on the farm than in the city, but total vegetables and fruits are more important in the urban diet. Alto-

gether 12 foods—beef, pork, other meat, fish, milk, eggs, cheese, butter, lard, wheat flour, sugar, and potatoes—furnish about 75 per cent of the energy of the urban diet and 85 per cent of the farm diet.

Because of the importance of dairy products in the American farm diet, the nutritive need of the group is, on the whole, more adequately met, but the evidence is strong that the urban diet is more varied, deriving, as it does, 25 per cent of its energy from foods other than meat, fish, eggs, dairy products, lard, wheat flour, sugar, and potatoes. The farm diet derives only 15 per cent of its energy from other sources. These include largely fruit, green vegetables, and cereals other than wheat.

The figures that are given here represent averages for the country as a whole. In certain parts of the United States the conditions which prevail are very different. This is especially true in the cotton regions of the South, where 70 per cent of the population is rural. The disease known as pellagra is much more frequent here than in the urban population. It is a deficiency disease caused by a diet lacking in one of the vitamins. The diet of the people affected consists, on the whole, of cornmeal, fatback, and sirup or molasses—foods valuable largely for energy. After a poor cotton year, or a disaster like a Mississippi flood, the disease is especially severe among the farm families. In order to correct the trouble, the limited diet commonly used by such families must be supplemented by dairy products, fruits, and vegetables.

From the evidence that is available, it is difficult to say definitely whether the rural or urban diet is superior. In either case, when it is limited to a few foods, the danger of deficiency diseases is greatly increased, but if milk, fruits, and vegetables make up an important proportion of the foods consumed, a very monotonous diet may become almost adequate. The only nutrient likely to be deficient in such a diet is iron, a factor found largely in whole-grain cereals, meat, eggs, and vegetables.

EDITH HAWLEY,

Senior Home Economist, Bureau of Home Economics.

DIET Selection Aided by Broadcasting of Menus and Recipes

The book of radio menus and recipes first issued by the Radio Service in co-operation with the Bureau of Home Economics in 1926 in loose-leaf mimeographed form has gone into a third enlarged and revised printed edition. This might pass as a fact of no particular importance were it not an index of listener interest in the department's radio programs for women. It is of even greater significance as a measure of the form in which the public wants and calls steadily for more information on food values, nutrition, and applied food economics.

A recipe or a menu on first thought seems trivial—a particular dish or combination, eaten to-day and forgotten to-morrow. Taken by and large, however, they make up the food habits of individuals, nations, races, and each year brings more definite scientific proof of the connection between dietary customs and health. Pellagra, rickets, scurvy, dental caries, and other less obvious but no less serious disorders are traceable to lack of specific food constituents over varying periods of time. Small wonder then that the demand increases for methods of preparing and serving foods that incorporate the nutritive elements emphasized as important by the latest findings of science.

For about 40 years the Department of Agriculture has been active in gathering information on food values and habits. It has helped to define the rudiments of scientific food selection and to get calorie, protein, vitamin, and other nutrition terms into the lay vocabulary. Almost everybody now knows in a general way that the day's meal should contain the right food elements in the right proportions, but in the hurry and scurry of buying foodstuffs and preparing meals these principles do not always get into practice.

Listener Response Shown in Heavy Mail

In fact not until the radio programs for housekeepers were started in 1926 was it realized how great is the need for the translation of nutrition facts into the simple, practical terms of menus and recipes. Within the first month letters began trickling into the Radio Service and the Bureau of Home Economics saying that Aunt Sammy had solved that perplexing, daily recurring household problem—what to have for dinner. These letters have grown steadily in volume until at the height of the winter 15,000 a month are received. Along with many of the requests for the book of radio recipes and menus, come questions indicating the effect of food faddism, unethical advertising, and half knowledge of scientific facts that oftentimes works more harm than good. The opinion of the department is sought as an impartial authority likely to have first-hand information based on extensive research.

As a medium for giving economic information on foodstuffs to the home maker in a form she can put to immediate use, the menus and recipes are proving equally effective. New foods gaining in agricultural importance are introduced to her, not in general terms, but with explicit directions for cooking and serving so that she need have no hesitancy about giving them a trial. For the old familiar foods, new and improved methods of preparation are described. Seasonal fluctuations in supplies are constantly taken into account, and in times of overproduction of certain foodstuffs ways are suggested for their more abundant use without unduly restricting the consumption of other staples.

The menus and recipes can be related only to widespread market conditions, however, for the programs go to over 100 radio stations for broadcasting in every part of the United States. With this nationwide scheme of distribution it is no easy job, especially in midwinter, to plan dinners equally acceptable in Montana and Mississippi, Maine and Arizona, and to take advantage of the profusion of fresh foods available in metropolitan markets without emphasizing the limitations of the small-town grocery. It is expected that the menus will, more often than not, be changed to suit local supplies. A range of choice is often given to show how easy it is to substitute spinach for cabbage, kale, or whatever the green-leaf vegetable may be, and to use rice, macaroni, hominy, potatoes, and the various starchy foods interchangeably and still maintain the same nutritive balance.

Growing Demand for Nutrition Facts

As a by-product of its research in food utilization, vitamin studies, food habits, and child feeding, the Bureau of Home Economics has supplied 400 menus and 450 recipes to the Housekeepers' Chats since their start on a five-a-week basis in the fall of 1926. Though the

broadcasting of scientific material by radio is still in its early stages, more than 500,000 home makers have already registered their approval of this disinterested service. This does not mean that these women have become "recipe-minded." The stock jokes about women's club meetings being recipe exchanges are as out of date as the old quips on the hayseed farmer. The American people are food-conscious in a new way. There is a growing desire on the part of the average consumer for knowledge on how best to make food supplies function toward better nutrition and an increasing interest in applying economic principles to everyday food selection. The radio menus and recipes are an answer to both, and a link between the research of the department on food production, distribution, and utilization.

RUTH VAN DEMAN,
Associate Specialist in Charge of Information,
Bureau of Home Economics.

DRAINING of Irrigated Land by Pumping From Wells Often Advisable

The draining of irrigated lands presents more difficult physical and economic problems than does irrigation itself. Often the need for drainage is not anticipated and when water-logging and its attendant evils require large expenditures which bring no direct benefits, except to protect the original investment for irrigation, the financial burden becomes very great. After a number of years those in charge of some irrigation enterprises find that an additional irrigation supply is necessary for complete development, while at the same time they are confronted with the problem of removing excess water from low areas, and usually deep gravity drains discharge the water at a point too low for reuse.

It has been found that shallow drains are ineffective where alkali is present and for the past 25 years the trend has been toward deeper systems; drains 12 to 15 feet deep are not uncommon. Frequently water-logging develops in soils and subsoils so dense that even deep drains are effective only for very short distances, with the result that the cost of reclamation becomes very high.

Many gravity-drainage systems in the irrigated West, particularly those of the open type, are deteriorating because of lack of maintenance. Plant growths and silt accumulate rapidly and if they are not removed the drains cease to be effective and may eventually fill up.

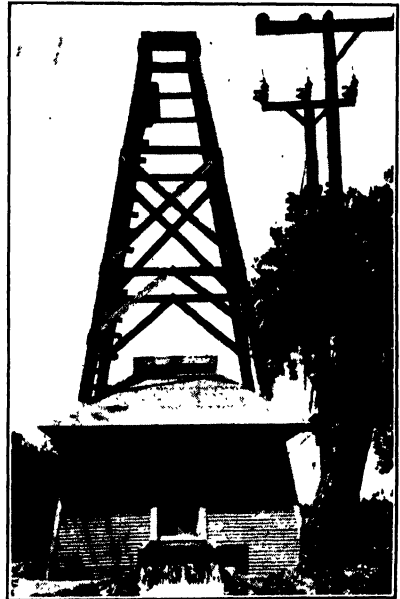


FIGURE 55.—Type of pumping plants used for drainage in the Salt River Valley, Ariz.

Even underdrains are sometimes subject to trouble caused by displacement, silt, or roots. While a great number of successful gravity systems are in operation, it is gradually being realized that the cost of properly operating and maintaining these may be very high.

Great Advance in Drainage By Pumping

Perhaps the greatest advance that has been made in the drainage of irrigated lands is the adoption of pumping from wells. It has long been known that relief wells are effective under some conditions. Also the lowering of ground water by pumping is not new since the available supply has been depleted under areas pumped for irrigation. The Salt River Valley Water Users Association in Arizona successfully applied this system to the reclamation of water-logged areas and since then several other projects have adopted it and others are considering its use.

Any drainage system must have sufficient capacity to cause a general lowering of the water table. A gravity system should reach into a free water-bearing stratum; however, this is not always possible. The



FIGURE 56.—Type of pumping plants used for drainage in San Joaquin Valley, Calif.

well method requires that such a formation be reached but it does not need to be near the ground surface as is the case with gravity drainage.

Wells can reach permeable layers at depths to which it is practically impossible to construct gravity drains. Drainage wells vary in depth from less than 100 to considerably over 200 feet, while the pumping lift varies from about 25 to over 50 feet.

A necessary physical condition for pumping is that there be a connection between the soil water near the surface, and the water-bearing stratum reached by the well. The well method has been used successfully where the subsoil appeared to be quite dense and relatively impermeable to considerable depths—so much so, in fact, that gravity drains were ineffective. However, some connection must have existed in these cases for it is obvious that pumping would not be effective if a continuous layer of wholly impermeable material separated the upper soil from the water-bearing layer penetrated by the well.

Drainage wells are spaced from one-quarter to 1 mile apart, and when the pumps are operating water moves laterally through the permeable layer toward the wells while water in the upper soil and subsoil moves more or less vertically downward to replenish the supply. The cross-sectional area through which this upper water moves is very large and the distance through which it must travel downward to produce desired results is very small, so that the required rate of movement is very slow. Thus water is extracted at a velocity but little or no greater than that existing when it was introduced into the soil.

Power Cost May Be High

While the first cost of a well-drainage system may be low, the annual cost for power, together with other expenses, may be quite high. A

majority of the projects using this method pay only approximately 1 cent per kilowatt hour for electrical power. At this rate it costs about \$1 for power to pump 1 acre-foot through a lift of 50 feet. To this must be added items for interest on investment, depreciation, operation, and maintenance. A high cost of power might make pumping prohibitive under many conditions.

An advantage of the pumping method is that water is delivered at an elevation sufficient to permit its reuse. The majority of the projects employing this method are deriving some benefit, either by profitable use or sale, from most of the water developed. On practically all, the developed water has a real value to the project and this can be and is credited to the drainage account. In some instances the value of the water developed is nearly as great as the cost of pumping. Where such is the case, the cost of drainage is very low or almost nothing.

Well drainage provides a means for reclaiming some areas where, due to geological or topographical conditions, no other method is



FIGURE 57.—Two of the types of pumping plants used for drainage in San Joaquin Valley, Calif.

practicable. A system can be installed in small units. This permits great flexibility in design and operation. The method eliminates unsightly ditches and waste of land. It commends itself for consideration in the development of new irrigation projects where water is within easy pumping distance, thus reducing the gravity and storage supply that otherwise would be needed, while at the same time providing protection against the accumulation of alkali.

Pumping from wells is not recommended for all localities. Undoubtedly there are numerous places where it would fail and many others where gravity drainage would be cheaper. In general, however, it has met with such marked success thus far, that no new drainage project should be initiated nor the rehabilitation of an old inefficient gravity system undertaken without first giving some consideration to this method.

L. T. JESSUP,
Associate Drainage Engineer, Bureau of Public Roads.

ECONOMIC Periodicals Issued by Department Aid Farmer's Business

Misinformation causes the mercury of the agricultural price thermometer to fluctuate out of line with actual conditions. Market prices often change wildly on the circulation of false information. The Department of Agriculture, therefore, has built up the largest statistical organization in the world for gathering reliable crop and market information. It spends approximately \$5,000,000 a year for the collection of statistics alone.

On all production, marketing, and prices the department compiles comprehensive information, and arranges it in a concise and understandable form. Some farmers are interested in following only one crop. To those who want to find out what is causing price variations, and who want to study conditions in more or less detail and to make interpretations of their own, the department gives a composite report of agricultural progress in a monthly periodical known as *Crops and Markets*.

Crops and Markets carries reports, showing crop acreage, crop conditions during the growing season, probable production, final production, yield per acre, and farm stocks; reports showing the condition, numbers, and values of livestock; reports on the farm-labor supply and demand, and wages paid to farm labor; reports on population changes; agricultural outlook and intentions-to-plant-and-breed reports; pig-survey returns; cost-of-production figures, and estimates of income from production. It also records shipments to or receipts at stated markets, and cold-storage holdings. It gives prices, both those received by producers and those paid at wholesale markets, as well as analyses of factors affecting the price situation. A set of charts in each issue shows at a glance the price trend of the major agricultural products.

No other periodical contains as many facts essential to agriculture. It is used not only by farmers but by State and Federal Government agencies, such as the Federal Farm Board, the Federal land banks and the intermediate credit banks, the extension services, the agricultural colleges and experiment stations, and the State marketing bureaus.

Crops and Markets is printed in an edition of 140,000 copies monthly, and goes to every State and Territorial possession of the United States as well as to a number of foreign countries. Under the provisions of a resolution of Congress, it is sent free to libraries, the press, Government officials, workers in agricultural colleges and experiment stations, and other institutions or individuals actually assisting the department in collecting or diffusing information. To others it is available at the nominal subscription of 60 cents a year (foreign rate 85 cents), payable to the Superintendent of Documents, Government Printing Office, Washington, D. C.

CATHERINE M. VIEHMANN,
Assistant Editor, Bureau of Agricultural Economics.

ECONOMIC Trend as It Affects the Farmer Summarized Monthly

How is the average farmer to keep posted on the thousand and one things which are happening every day in the year and all over the world, which directly affect his fortunes? Perhaps there is a strike in the British textile mills—its effects spread almost instantly over our Cotton Belt. Perhaps there is a drought in the Canadian wheat Provinces, or an extra shipload of Australian butter diverted to New York, or a sudden

freeze in our fruit sections. Perhaps the country takes an inventory of its hogs or cattle or other livestock, as is done periodically, or perhaps a new crop estimate reveals important changes on the supply end. An endless chain of events moves forward from day to day, all having a decided influence upon prices of farm products and ultimately upon farmers' incomes.

Washington has become a natural clearing house for information respecting these economic developments. The Department of Agriculture now has the machinery for learning very quickly of such developments, not only in this country but over the world at large.

The Bureau of Agricultural Economics, through its crop and livestock estimates, its agents in the markets, its foreign service, and other sources, receives a constant flow of such facts. At the same time a steady stream of reports goes out from this bureau carrying to farmers and the public a fairly complete picture of happenings, not only on the production end but on the marketing end as well. By telegraph, radio, press, and mail this flow of timely information is maintained.

Among other things, the Bureau of Agricultural Economics tries to bring together the most salient information each month and present it in very condensed form for busy farmers, extension men, agricultural tradesmen, and others. Thus, on the first day of every month it issues a publication of 24 pages called *The Agricultural Situation*. This little monthly, printed on distinctive blue paper, is sent free to various correspondents of the department and to public institutions and may be obtained by anyone at 25 cents per year.

This publication presents a tabloid picture of the events that largely influence the farmer's economic position from month to month. Throughout each month, the developments are watched respecting the growing crops and animals, the movement to market and into foreign trade, stocks in cold storage and elsewhere, the trend of prices and of consumption. The most significant items are picked out of this swiftly moving procession. These are pieced together to make up the picture of what is essentially the current agricultural situation. A few paragraphs, a few tables, a few charts, and the busy man can gain a very fair idea of the general trend of things.

This monthly publication differs from the many other types of reports issued by the department in that it presents this condensed bird's-eye view of significant changes, month by month. In these times of rapid, highly organized commerce, the successful farmer requires a fund of current information such as was not necessary a generation ago. He can not plan his operations without it but he is unable to follow all of the changes in detail or to read many reports. Here, for him is a condensed, boiled-down source.

A. B. GENUNG,
Senior Agricultural Economist,
Bureau of Agricultural Economics.

EGG Prices Manifest The receipts of eggs in the four
Combined Influence of principal markets (New York,
Storage and Consumption Chicago, Philadelphia, and Boston)
constitute our most representative
index of production and consequently our best index of the influence
of current supply on price. (Fig. 58.)

Receipts on these markets are the highest during the spring and early summer months and gradually decline in the fall until they reach the low point in November or December. In recent years there has been a gradual increase in production during the fall. This tendency is partly responsible for the downward trend in fall prices and the narrowing spread between the price at which eggs are placed in storage and the price at which they come out.

Cold-storage holdings of eggs perform an important market function and have a marked influence on prices of eggs, particularly in the fall and winter months. Uneven seasonal production results in a surplus during the spring and scarcity during the fall and winter, whereas the demand for eggs is relatively constant throughout the year. Therefore, it is one of the functions of the wholesale dealers and storage operators to obtain a supply in the spring adequate to meet consumer requirements as nearly as possible, at all seasons. This is brought

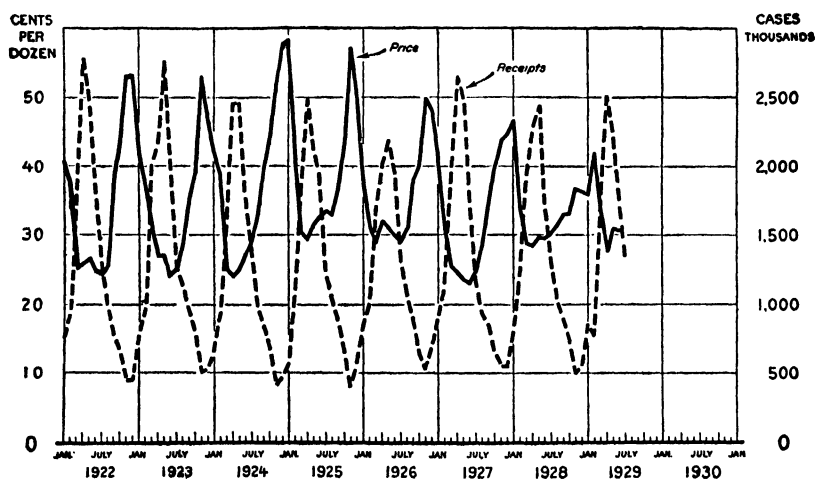


FIGURE 58.—Receipts of eggs at four markets and prices of fresh firsts in New York. The marked seasonal movement in the monthly receipts of eggs causes the variation in egg prices. The placing of eggs in storage during the spring months keeps prices from dropping in proportion to increase in receipts. Eggs from storage in the fall supplement the small current receipts and prevent prices from rising to prohibitive levels.

about by moving a part of the eggs in the spring through the usual channels for immediate consumption, while the greater part of the remainder is carefully handled, graded, packed, and shipped to cities be placed in cold storage until fall and winter. Eggs in the remaining portion of the supply are broken open, frozen, and placed in storage.

Twelve Per Cent of Production Stored

About 12 per cent of the total annual production of eggs is stored. Eggs move into storage during the months of March, April, May, June, and July and move out of storage during the other months. The peak of storage holdings is reached by August 1. Practically all of these eggs are taken from storage and consumed by the end of the following February.

As eggs are not carried over from one storage season to another, storage operations exert a large influence on prices. The cold storage of eggs is a sound, economic practice and performs a twofold function.

If eggs were not placed in storage in the spring, prices would be so low as to make egg production unprofitable to producers, whereas the fall supply would be inadequate and the price would rise beyond the reach of most consumers.

The practice of storing eggs in the flush season results in a demand from two sources—that for immediate consumption and that for storage. This tends to insure to the consumer an adequate supply of eggs throughout the year at reasonable prices, and to the producer a higher price during the season in which he has the largest quantity to sell.

The price that the consumer is willing to pay for eggs determines, to a large extent, what the egg dealers can pay. The relative importance of eggs in the menu of the average person is as yet undetermined, but it is considerable. Studies now under way should throw light on the consumers' demand and preference for eggs of different internal qualities and external appearance, as well as the consumers' response to varying prices for eggs of different qualities. When these and related

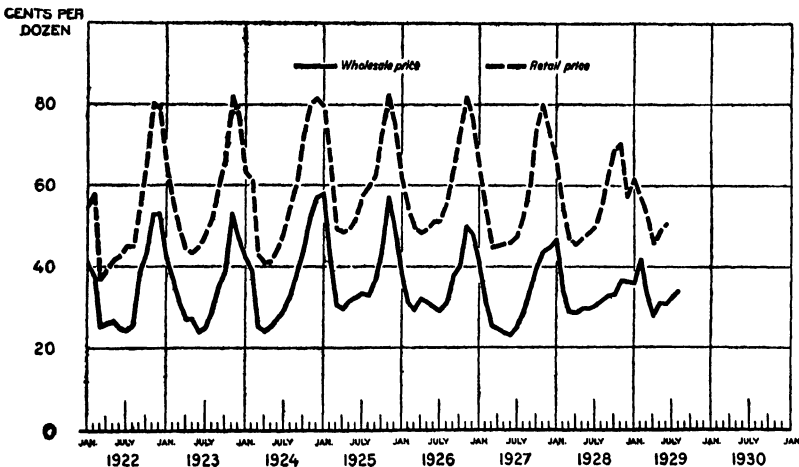


FIGURE 59.—Wholesale and retail prices of fresh eggs in New York City. Wholesale and retail prices tend to move together. Wholesale prices change as the supply varies and these changes are reflected in retail prices. Moreover, demand varies through the year which also has an influence on wholesale prices

facts become better known, and merchandising is conducted in accordance with the ascertained facts, it is probable that the demand factor will be found to exercise a more important influence in the determination of egg prices than it is now definitely known to exert.

Relation Between Retail and Wholesale Prices

Consumers' demand is reflected through the retailers, and retailers' demand is reflected through wholesalers. If the wholesalers buy large quantities at a given price, or the same quantity at a higher price, this indirectly indicates that the consumers' demand is increasing. A decreasing consumer demand is indicated when a given quantity will be taken only at a lower price. The close relation between retail and wholesale prices may be seen in Figure 59.

Many factors may contribute to cause variation in consumers' demand. General business conditions, through influence on pay rolls,

is one factor. In times of prosperity employment is more general and continuous. In such circumstances it is generally assumed that more eggs will be purchased at a given price, or the same quantity at a higher price, than when the reverse conditions prevail.

The price level of eggs is of special importance to the egg industry during the period from March to June inclusive because of the two types of demand at this season. Egg prices usually reach their lowest level during March and tend to maintain an almost horizontal level or to move upward very gradually until June, when a more pronounced upward trend begins.

Spring receipts and United States storage holdings (June 1 or August 1) exert their largest influence on the fall prices of Refrigerator Firsts and on fresh fall eggs. Therefore they serve as an index of the fall situation. When they are large, fall prices of Refrigerator Firsts tend to be low. The relationship between these factors and the fall price of fresh eggs is just the reverse of that between these factors and the price of Refrigerator Firsts in the fall. This is explained by the fact that large spring receipts and storage holdings are associated with low spring prices, restriction of hatchings, smaller numbers of fall pullets, reduced fall layings, and consequently higher prices.

Changes in average monthly prices of eggs result from the joint influence in varying proportions of the many forces reflected in changes in receipts and in storage holdings.

F. A. BUECHEL,
*Senior Agricultural Economist,
Bureau of Agricultural Economics.*

EXHIBITS for Fairs Give Comprehensive Farm Information

The object of department exhibits is to present clearly the newest and most valuable information on agriculture. Every principle of illustrative art is employed to present the facts vividly and persuasively. The designer, the engineer, the woodworker, the machinist, the electrician, the modeler, the artist, all combine their talents to accomplish that purpose. Pictures, diagrams, legends, light, sound, and motion help to portray what department research has discovered to improve and advance agriculture.

The exhibits are take-down structures, designed and built in articulate parts. They are assembled readily at exhibition points and as readily dismantled and reshipped to other fairs. They are well and strongly built, and by renovation and revision, endure for many showings. The exhibit structures, wherever feasible, are designed to create settings helpful to immediate, clear understanding. How to produce clean milk, for instance, is explained in a representation of a milk house with its equipment and conveniences in place. Right uses of forests for timber, for stream-flow control, for propagation and utilization of wild life, and for recreation, are presented in structures that depict lumbering operations, wooded slopes, hunters' cabins, cool, sequestered wildernesses, or modern forest highways and camps. Stories about 4-H club work, crop improvement, better sires, market possibilities through cooperation, all begin their appeals through familiar settings. Many of the exhibits are operated by electrical and mechanical devices, and many are supplemented by objects and specimens of the things discussed.

The completed exhibits are arranged in convenient groups for shipment to fairs in freight carload lots. Each exhibition group deals particularly with one or more of the major agricultural subjects, but for variety contains a few exhibits on other subjects. In planning exhibition programs, care is observed to provide fairs with exhibits on agricultural enterprises that are important in the regions served by the fairs, and on those phases of the subject that will be most useful. Department publications which offer additional information on the subjects presented in the exhibits are furnished for distribution in connection with the displays.

A carload of exhibits when installed occupies from 100 to 140 running aisle feet of floor space about 10 feet deep, or from 1,000 to 1,400 square feet, depending, of course, upon the size of the group. The exhibits provide their own structures and wall displays and can be installed in almost any type of space. It is not necessary that space be in unbroken lines. The exhibits can be set up along two or more sides of an aisle, in hollow rectangle back to back, two ways from a corner, and in other and more varied arrangements.



FIGURE 60.—Exhibit structures are designed to create settings helpful to immediate, clear understanding

Funds Appropriated for Specified Purposes

The regular educational exhibits of the Department of Agriculture are prepared and displayed by the department Office of Exhibits under an appropriation that provides specifically for exhibitions at State, interstate, and international fairs. The Office of Exhibits does not have funds for exhibitions at any other types of occasions. The exhibits are available, therefore, to State, interstate, and international fairs that apply for them and that subscribe to the regular cooperative agreements.

Each Department of Agriculture exhibition is conducted under a cooperative arrangement that makes it a joint enterprise with the fair:

The department furnishes the exhibits and provides personnel for their management and demonstration. The fair provides for the transportation of the exhibits; bears the cost of drayage at the exhibition point; furnishes space, common labor for installing and dismantling the exhibits, and such electrical and other special services as may be required to accomplish a successful display.

The transportation cost is the same for all fairs regardless of distance, the amount being determined by estimating closely the total charges on shipments of exhibits to all of the fairs tentatively scheduled in the season's program throughout the United States, and dividing the sum equally by the number of fairs. Full advantage is taken of all railroad tariffs that provide for the movement of exhibits at reduced rates.

Representatives to supervise the installation, presentation, and dismantling of the exhibits are sent to the fairs at the expense of the department. Demonstrators are carefully selected with regard to their experience in department exhibit work, as well as to their knowledge of agricultural subject matter and their tact and ability to cooperate.

Shipment In Carload Lots

Shipments move in carload lots over complete circuits. Occasionally a fair may not have room to display all of the items in a group. The extras are then stored at the exhibition point until the close of the fair and reloaded with the material actually shown. It



FIGURE 61.—Photography, modeling, painting, carpentry, and mechanical and electrical work were required to produce this mechanical man that milked a mechanical cow

is not practical to break groups or to combine selections diverted from two or more groups. Freight rates are higher for less-than-carload lots and idleness would be enforced upon the unused portions of the groups which would reduce the number of exhibitions that could be made during the limited period of the fair season. Sometimes, however, it is possible to provide a fair with more than one group if desired. In that event, the fair cooperates to the extent of a share of the transportation cost and the other cooperative conditions for each group.

When a group of Department of Agriculture educational exhibits is desired by a State, interstate, or international fair, application should be submitted to the Office of Exhibits, United States Department of Agriculture, Washington, D. C. The application should state the general agricultural subjects that are best suited to the region served by the fair and upon which exhibits would be most helpful. It should indicate, likewise, information concerning the amount of space for

which exhibits are desired and whether the fair is in position to meet the cooperative conditions under which the exhibits are available.

GEORGE H. COOK,
In Charge Exhibition, Office of Exhibits, Extension Service.

EXTENSION of "Outlook" Information to Farmers Meets Practical Need One of the chief problems of the farmer has been a lack of economic facts that would be helpful in planning and operating his business. The aim of every successful farmer is to make his management represent his best thought. To do this, his first task is to think his problems through. The extent to which farmers know the facts of their business and relate these facts to "outlook" information as a basis of each future year's operations is closely associated with the degree of success attained.

The agricultural-outlook work is an attempt to help farmers in the analysis and interpretation of available facts bearing on conditions that will probably be encountered when products of the coming season's operations are ready for market. The outlook extension work, therefore, involves two considerations: (1) Helping farmers make a more careful study and analysis of their individual business as a basis for finding the strong and weak points, and (2) supplying farmers with outlook and other timely information for use in deciding whether to change the acreage of crops or numbers of livestock ahead of planting or breeding season.

The attempt is made to give outlook information in terms of both local and national conditions, since farmers have both local and national problems to consider. It is supplied through published reports, meetings, news articles, radio, and other means.

Two rather distinct considerations are included in the extension plans for the outlook educational program. The first includes a program designed to assist the farmer in obtaining better knowledge of price and production changes, supply and demand, and the related economic factors. This is essential as a forerunner of other work. It helps the farmer to understand the application of timely economic information to problems that arise throughout the year. The second consideration is that of supplying farmers with the outlook information at timely periods. The wide diversity of commodities and conditions throughout the United States makes this a perplexing problem. Experience in this connection suggests that outlook material to be of most value should be interpreted in terms of specific regions.

Steps In Outlook Extension

The plan for extending outlook information varies among the States, because of differences in conditions. Following are some of the important steps used in organizing and conducting this work in a number of States:

Cooperation of extension and subject-matter workers in getting material in usable form.

Conference of extension specialists and supervisors for study and discussion of outlook material and the uses to be made of it.

Discussion of outlook material and plans for using it by county agents and other workers at annual conferences or at special conferences called.

Holding of regional and local outlook meetings. Making outlook material a part of subject-matter meeting programs.

Furnishing county agents with plans, lecture outlines, charts, and news articles. Giving wide publicity through the press.

Securing cooperation of farm organization officials, Smith-Hughes teachers, bankers, and others.

Appointing and training local leaders.

Making the outlook work a continuous project. Placing increased emphasis on the timeliness and adaptability of commodity data and on the relation of all extension work to the agricultural outlook.

A summary of the accomplishments of the Extension Service in extending outlook information during 1928 is as follows:

State Outlook Reports

In addition to the national outlook reports, 38 States prepared reports. The New England States jointly prepared a regional report. Reports from 31 States showed a total of 257,418 copies of outlook reports distributed. Of these 90 per cent represented State publications. There were 632 meetings conducted by specialists and 643 by county agents with a total attendance of 68,921. The number of all other meetings at which outlook material was used was 1,265, attended by 47,182 people. This makes a total of 2,540 meetings held with 116,103 in attendance. There were 119 economics specialists and 175 other specialists who participated in the work.

A total of 1,419 counties in these 31 States were reached specifically with outlook information. In 828 counties, outlook meetings were held, and in 1,051 counties the county agents are making continuous use of outlook information. A total of 175 radio talks on outlook were given in these 31 States. Many States are continuously disseminating outlook information and thereby reaching many thousand additional farmers through regular production meetings.

Some examples of how farmers use outlook material are also becoming available. Information from the college of agriculture includes the statement that a farmer in Massachusetts, who has grown much tobacco in years past, increased his potato acreage and decreased tobacco for two years previous to 1928, because of a more favorable outlook for potatoes than tobacco. In 1928 he increased tobacco and decreased potatoes, because of a reversed situation. He is now increasing his dairy, as he feels that less dependences should be placed on cash crops than formerly. Another farmer, in North Dakota, wrote the college of agriculture as follows:

I have been studying your outlook report quite closely during the past year and have found the information contained therein to be of great value to our farming business. Anyone whose interest lies in the marketing of farm products can well afford to make use of this official information as it is released in this bulletin, if he desires to market his products intelligently and reap the greatest profit. I can see no way in which this can be done unless the farmer has some way of knowing something about the supply and demand of the agricultural commodities.

The important thing is that farmers in increasing numbers each year are making careful study of their individual business and better use of outlook and related data. "Know all the facts, then go ahead" is the slogan that quite aptly fits the idea back of this type of extension work.

Outlook extension work, although comparatively new, has demonstrated its worth and its place in the program. With the addition of

outlook and related economic information in his program, the county agent is in a better position to advise with farmers regarding what to produce, how much to produce, and how to produce it efficiently.

H. M. DIXON,

Senior Farm Economist, Extension Service.

FARM Home Makers Get Little Aid in Housework from Others in Family How much help does the farm woman receive in her home making? Does her husband give much time to assisting with household tasks and minding the baby? Do the children give mother a hand? Is a hired girl frequently employed to lighten the work?

A study recently made by the Bureau of Home Economics answers these questions, at least for 559 farm women who cooperated in the study. Each one of these home makers kept a careful record for a week of the time spent in different home-making jobs by every person in her household, including herself. The results make it clear that the work of the home is no longer a family affair. Almost all of it falls to the lot of the home maker herself. While these farm women spent 51¼ hours a week on the average in home-making tasks, only 9¼ hours a week were spent by all other persons in their households.

Most of this help, of course, came from members of the family—7¼ hours a week in the average home, or a little over an hour a day. Only 1 hour a week was given by hired help, and the remaining half hour came from guests in the home.

Who were the members of the family giving this slight amount of help? Just 2 hours a week were contributed by the farmer himself, 4½ hours by daughters and other women relatives in the home, and 1¼ hours a week by sons and other men relatives.

Much Variation in Help Received

These figures, however, are averages for all of the 559 households. Naturally many of these farm women received less help than 9¼ hours a week, and some received much more. One home maker, in fact, was blessed with 111 hours of help during the week, or almost 16 hours a day. But this was a most unusual household, with five children under 10 years of age and a hired girl and a hired man to come to the mother's assistance. In the great majority of cases the amount of help given the housewife was very small. Only 70 of the women received as much as 3 hours a day, and in contrast with these were 99 who had no aid whatever during the week of their records.

How much help a particular home maker received depended first of all, of course, on whether she had a hired girl. But only 29 of these housewives employed any paid help whatever, and half of these had less than 7 hours a week. Only 6 home makers, in fact, had full-time hired help.

A daughter of high-school age or over, or a sister or other woman relative living in the home, was the housewife's next best chance of assistance. Just 103 of the group had help from this source; but again the amount of time which each helper gave was small, averaging 13¼ hours a week for the women of 20 years of age or over, and only 10¼ hours a week for daughters of 15 to 19 years. For younger daughters,

the figures dropped still lower—to 6 hours for girls of 10 to 14, and to $3\frac{1}{4}$ hours for girls of 6 to 9.

The men of the household, as would be expected, made an even poorer showing. Two-thirds of the husbands lent a hand in some phase of housekeeping, but the amount of help which they gave made but a small dent in the volume of work to be done—3 hours a week on the average. The sons who helped gave still less time, even the older ones averaging less than $2\frac{1}{2}$ hours a week. The little boys under 6 were the only ones to keep up with their sisters of the same age, the youngsters of each group doing their bit to the extent of about an hour and a quarter a week. In 30 cases the hired man also joined in, spending 2 hours a week on the average on household jobs.

Degree of Need Not a Big Factor

Whether the home maker needed help or not had little effect on the amount which each member of the household gave. Even when there were several small children to be cared for, the husband and the older children spent scarcely any more time than when the home maker had an easier job. It was the number of persons in the household old enough to share the work that determined how much help she received, not the quantity of work to be done, and especially it was the presence of another woman or older daughter.

Take, for example, the 24 home makers who received the largest amount of help—more than 5 hours a day. Twenty-one had the assistance of a hired girl or a daughter or other woman relative over 14, from whom most of the help came. And even in the 3 remaining households the chief helper was a young daughter. In 2 a girl of 12 gave almost all the help, and in the third a daughter of 8 gave half, while her 5 brothers and her father together contributed the other half. At the other extreme were the 99 home makers who received no help at all. For 75 the reason is clear—they had families of men and boys only. And in all but 7 of the other households the daughters were all under 10.

What is the explanation of the small amount of help which the men of the family gave—when they gave any whatever? A glance at the kind of work they did gives the answer. Their main job was carrying wood and caring for fires, and when there was water to be pumped or carried, this chore, also, usually fell on masculine shoulders. For the most part, that is, they were called upon for jobs which take very little time, even in a large household. It was the meals, the cleaning, and laundering which formed three-fourths of the work, and in these jobs it was usually only the women and girls who were expected to help. When there were no such helpers in the household, these tasks were apparently still thought of as women's work and left in the hands of the housewife herself, no matter how heavily burdened she might be.

Care of Little Ones Wholly Mother's Job

As for that other phase of home making, the care of small children, it remained almost wholly in the mother's hands, even when there were daughters or other women who might have relieved her. If she had any help from her family, she used it mainly to lessen the time which she herself spent in the housework. Only two-fifths of the 181 mothers

with children under 6 had any help in dressing and bathing and "minding" the youngsters. And even for these the assistance amounted to only $3\frac{1}{2}$ hours a week. In the 17 households where there was a baby less than a year old, however, the family made a better showing. Fourteen of the mothers had some help, and the average amount was about 6 hours a week.

As for the father's share in the care of the children, only one-fourth of those with children under 6 were credited with any assistance, and the average amount which these 44 gave was but $2\frac{1}{2}$ hours a week.

The picture of the situation in regard to help which these 559 farm homes present can not, of course, be taken as representative of all the farm homes of the country. The number is too small to justify general conclusions. But it is interesting to note that the main outlines of the picture are the same when the records from different sections are studied separately. The largest group, 248, came from California, 112 from the Middle West, 107 from New York State, 42 from the South, and 40 from Idaho, while the remaining 10 were scattered over various States. Altogether 25 States were included in the records.

RUTH MOORE,

Junior Home Economist, Bureau of Home Economics.

FARM Incomes Averaged \$1,840 Per Farm Yearly in Period 1924-1928

The economic data of the United States Department of Agriculture now include for the first time estimates of the agricultural income in

each State. During the summer of 1929, the Bureau of Agricultural Economics completed estimates of gross income from farming and cash income from farming for each State for each of the five years, 1924 to 1928, inclusive. The estimates are published elsewhere in this volume.

The bureau has made and published⁶ estimates of the income from agricultural production for the entire United States for each year since 1919. These estimates were based on national data on production, sales, and prices. The bureau has also collected reports of incomes from 6,000 to 16,000 individual farmers scattered throughout the United States each year since 1922 and has published⁶ a compilation of the reports for the entire country and for the main geographical divisions. This information has been valuable in appraising the agricultural situation and in judging for the country as a whole the improvement or retrogression in agricultural conditions from year to year.

It has always been recognized that agricultural incomes vary markedly from State to State, from season to season, but suitable measures of the variations have not been available. Many rough indications have been used, such as crop-condition reports, prices of principal commodities, sales of mail-order houses, and even reports from local observers. These rough indicators have been useful for commercial purposes. The bureau estimates now provide means for comparing the gross agricultural income and the cash income from sales of farm products; that is, the annual results of farm operation on the revenue side, State by State, and year by year, since 1924.

⁶ Summary tables are included in the statistical section of this Yearbook. Annual reports in somewhat greater detail may be found in *Crops and Markets*.

Method Followed in Obtaining Figures

The method followed in obtaining the figures was to estimate, on the basis of all available information, the quantities of the various crops and livestock sold by the farmers in each State each year, the average prices received, and the quantities used for consumption in the farm home and their value. The total value of the crops and livestock sold is called cash income. The cash income, plus the value of the crops and livestock consumed in the farm home, is called gross income. Money income of farmers from activities or investment other than those connected with the farm have not been included in cash income, though such is known to be a considerable share of the income of many farmers in most localities. Nor has the value of the house rent been included in the estimate of gross income. Changes in real estate values, moreover, which have made and ruined many farmers in past years, have purposely been omitted from this set of computations.

Interest centers on net income rather than on gross income. Thus the figure that would depict the situation most accurately would be the difference between gross income and the cost of all the goods and services that are used in farm production. To find this difference it would be necessary to make estimates of the cost of feed, fertilizer, machinery, hired labor, taxes, and all the other items of expense in farming. At present, information is not complete enough on most of the expense items to enable us to make reliable estimates of expense items for each State each year, and the preparation of estimates of net income by States must await the obtaining of much information not now available on the expenses of farming. Until estimates of net incomes are completed, figures of gross income will serve to indicate major annual changes in results of farming—the summation of all the individual increases and decreases observed in farming conditions and the agricultural situation—in the different States and regions. In States where average gross incomes are high expenses of production tend to be high also.

Food Used by the Farm Families

Food used by the farm family represented about 15 per cent of the gross income per farm and amounted to about \$280 at farm prices per year during the period. The computed average for 1928 was highest for Arizona (\$399) and lowest for California (\$145). The average was \$389 for West Virginia, \$306 for Iowa, \$278 for Maine, \$244 for Arkansas, \$223 for Utah, and \$205 for Mississippi. Food used by the farm family was a higher percentage of gross income in the Southeastern States, where it ran above 19 per cent, except in Florida, than it was in the Northern and Western States where it fell below 15 per cent in most cases. In the far Western States less than 10 per cent of the gross income was accounted for as home-grown food used by the farm family.

Annual average gross incomes in the 5-year period show ups and downs in most of the States. California and Wyoming have shown improvement each year. Gross income per farm for 1928 was 24 per cent larger than for 1924 in California, and nearly 14 per cent larger in Wyoming. Maine in 1928 had 42 per cent less gross income than in 1925, the best year there, most of the difference attributable to crop values. North Dakota gross income dropped 30 per cent in two years,

but this resulted from reduction of 51 per cent in gross income from crops only partly offset by a 39 per cent increase in gross income from animal products. In Texas the worst year followed the best year (1924) of the five. In nine States 1928 was the best year of the five from the viewpoint of gross income, whereas, in seven States 1928 was the poorest year. In general, income from animal products ran more even from year to year than income from crops.

Average Gross Income Per Farm by States

The average gross income per farm in each State for the five years, 1924 to 1928, is shown geographically in Figure 62. These figures represent the value of sales per farm plus the value of farm products used in the farm home, and have been obtained by dividing the gross income in each State, as estimated by the bureau, by the number of farms in that State, as determined by the 1925 census of agriculture. The average gross income per farm varied from more than \$5,000 a year in Arizona and Nevada, where livestock production on a large

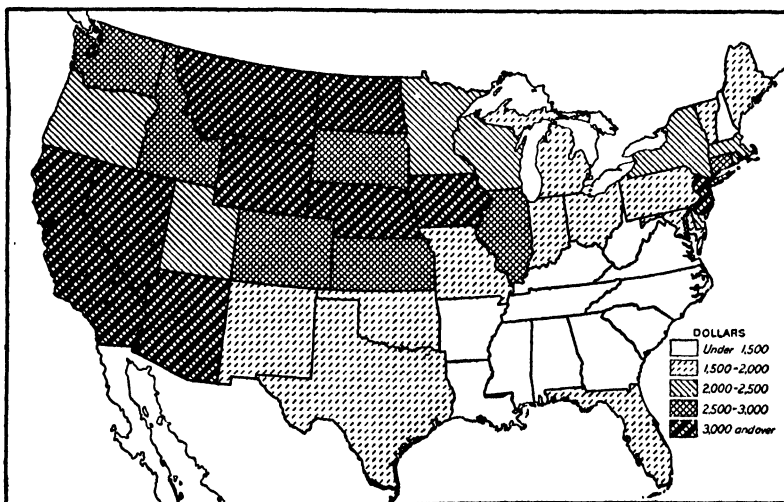


FIGURE 62.—Annual gross income per farm, 1924-1928

scale typifies the agriculture, to less than \$1,000 a year in Tennessee and Kentucky, where there are a great many relatively small farms on land poor and difficult to work—land the owners of which must either accept a low standard of living or supplement their incomes by working away from the home farm or at other occupations.

Differences in the average gross income per farm are not explainable on any single basis. For example, the \$660 excess in gross income per farm in Nebraska over Kansas is associated with 25 per cent larger farms, higher property values, more livestock, less wheat, more sugar beets and potatoes. On the other hand, greater expense per farm in Nebraska than in Kansas, indicated by the expenses for the four items reported for 1924 in the census of agriculture, would probably materially reduce the difference between the net incomes per farm in these two States. Similar considerations apply to the differences between other States usually considered to be in much the same agricultural situation.

Average Value of Farm Property

Average value of farm property January 1, 1925, as reported by the census varied from \$2,107 for Alabama to \$26,240 for Iowa, and averaged \$8,949 for all farms. The average gross income per farm in Alabama was 49 per cent as much as the value of farm property; in Iowa it was only 13 per cent; the United States average was 21 per cent. Except in a few of the Southern States gross income per farm is rather closely associated with average value of farm property, the higher the value the higher the gross income, the percentage fluctuating between 13 and 30 per cent.

These computations are at present necessarily based on figures applying to these several States. Variations in gross farm incomes within States are known to be large, the averages for the better parts being much larger than the averages for the less favored parts. Reporting on other than State areas must await improvements in the means of distributing data to subdivisions of the States.

H. R. TOLLEY,
Assistant Chief, Bureau of Agricultural Economics.

FARM Realty Value Down 1 Per Cent for U. S. in Year Ended March 1, 1929 Farm real-estate values, averaged for the entire country, showed a further decline during 1928 and the early months of 1929. The year's losses, however, were comparatively slight in those States in which declines took place, and for the country as a whole the net result was a loss of only about 1 per cent. In 1927-28 the corresponding loss was 2 per cent; in 1926-27, 5 per cent. This continuation of the characteristic downward trend of recent years brought the average acre-value of land and buildings for the United States on March 1, 1929, down to a position 16 per cent above the average for 1912-1914 taken as pre-war. This represents a position slightly below that shown for 1917. At the top of the boom in 1920 the corresponding figure was 70 per cent above pre-war. On the basis of its purchasing power (that is, making allowance for the depreciated dollar), the average value of farm real estate for the United States during 1928 and early 1929 continued to remain some 20 per cent below its pre-war position.

The Department of Agriculture's survey of the farm real-estate situation, which is made annually in March, showed that average values declined in 28 States during the 12 months ended March 1, 1929, remained unchanged in 16, and increased in 4. The increases, which were each about 1 per cent, were confined to 4 of the far Western States. Six of the 16 instances of unchanged values were also found there; 6 more of them were found in New England and in New Jersey and Delaware; the rest were scattered. The States of the Middle West and South rather generally showed declines, but nearly all the declines were small in amount; very few of the sharp annual losses so frequently found in preceding years took place.

The increasing number of instances of unchanged values, and of a progressively smaller size of the losses in States where the annual declines in recent years have been large, encourages the view that values have gone through their big readjustment in response to the

violent wartime distortions of the Nation's whole price system and that henceforth changes will be comparatively slow and small. The readjustment to date has been drastic, for values now are at or below pre-war in several of our richest agricultural States.

TABLE 7.—*Voluntary sales of farm real estate: Percentage of purchasers reported in specified classes of residence, and occupation, and purpose of purchase, for the United States and geographic divisions, 12 months ended March 15, 1928 and 1929*

| Geographic division | Residence | | | | Occupation | | | | | | Purpose | | | |
|-------------------------|-----------|-----------|-------|-----------|---------------|----------------|-------|---------------|----------------|-------|---------------|-------------------|---------------|-------------------|
| | 1928 | | 1929 | | 1928 | | | 1929 | | | 1928 | | 1929 | |
| | Local | Not local | Local | Not local | Active farmer | Retired farmer | Other | Active farmer | Retired farmer | Other | For operation | Not for operation | For operation | Not for operation |
| | | | | | | | | | | | | | | |
| United States..... | 84 | 16 | 84 | 16 | 80 | 5 | 15 | 78 | 4 | 18 | 84 | 16 | 83 | 17 |
| New England..... | 61 | 39 | 57 | 43 | 66 | 3 | 31 | 62 | 2 | 36 | 82 | 18 | 85 | 15 |
| Middle Atlantic..... | 75 | 25 | 77 | 23 | 65 | 5 | 30 | 67 | 4 | 29 | 83 | 17 | 85 | 15 |
| East North Central..... | 85 | 15 | 86 | 14 | 78 | 5 | 17 | 73 | 6 | 21 | 83 | 17 | 82 | 18 |
| West North Central..... | 86 | 12 | 88 | 12 | 86 | 6 | 8 | 82 | 5 | 13 | 85 | 15 | 84 | 16 |
| South Atlantic..... | 80 | 20 | 82 | 18 | 79 | 2 | 19 | 74 | 5 | 23 | 81 | 19 | 81 | 19 |
| East South Central..... | 87 | 13 | 87 | 13 | 79 | 2 | 19 | 78 | 3 | 20 | 85 | 15 | 82 | 18 |
| West South Central..... | 81 | 19 | 80 | 20 | 77 | 7 | 16 | 75 | 3 | 22 | 76 | 24 | 76 | 24 |
| Mountain..... | 81 | 19 | 86 | 14 | 92 | 1 | 7 | 91 | 1 | 8 | 97 | 3 | 91 | 9 |
| Pacific..... | 75 | 25 | 72 | 28 | 77 | 4 | 19 | 82 | 2 | 16 | 87 | 13 | 91 | 9 |

In general, the farm real-estate market continues to remain inactive, dealers reporting voluntary transactions at a minimum. Although generally below normal in volume—in many localities hardly enough to give a basis for estimating a “market value” according to reports—a few apparently voluntary sales are being made. According to information furnished for several thousand typical individual sales by correspondents of the Department of Agriculture, buyers in these transactions were largely residents of the county in which the farm was located, or of an adjoining county. Most of the purchasers were active farmers. Most of them bought for active operation either by themselves or their children. A degree of variation in these relationships occurred as is indicated in Table 7. In the New England and Middle Atlantic divisions, larger proportions of reported purchases attributed to persons not local residents and not active farmers will be observed. The bulk of these came from the larger cities.

E. H. WIECKING,
Agricultural Economist, Bureau of Agricultural Economics.

FARMERS Numerous in Throng of Motorists That Camp in Forests

The scene is any mountain road through Colorado and Wyoming; the time any day during July and August.

There is a steady stream of cars in both directions. Some of these motorists are ascending one of the dozen passes over the Continental Divide in Colorado to see the wonders of the western-slope country. Others have camped and fished in that region and are returning.

On Berthoud Pass, which is one of the main highways, from 300 to 1,000 cars pass in each direction daily. There are, of course, more

local cars from the surrounding towns and rural regions than from any other source. Next in point of numbers are those bearing the license plates of Kansas, followed by Oklahoma, Nebraska, Texas, Illinois, Iowa, and South Dakota.

Most of the out-of-State cars and many of the locals are loaded with baggage, bedding, and tents, and these cars carry the people who are camping in the national forests. Most of them are browned and hardened, and it is quite evident that they have come from the farms of the Plains States. They do not speed through the country aiming to make some town or city by night. Instead, they proceed leisurely, taking in the scenery, fishing in the mountain streams, and camping

where night overtakes them, in one of the many camps improved by the Forest Service with toilets, garbage pits, and fireplaces.



FIGURE 63.—Lodge-Stockton's Silver Lake camp, Eldorado National Forest

383,670 Campers in National Forests in 1928

During 1928 the national forests in Colorado, Wyoming, and South Dakota were used by 383,670 campers. In addition, 319,665 people picknicked in the national forests of these States. Many of these people came from neighboring towns and cities, but at least one-fourth were farmers.

In addition to the recreation which he enjoys the farmer sees timber cut conservatively so that the runoff, after heavy rains, may not start erosion and silt up streams, reservoirs, and valuable farm lands. At the higher elevations in the

forests he can see snow banks which form the bulk of the water supply for the irrigations of August and early September. Timber is being sawed into lumber at the local mills; railroad crossties, telephone poles, and mine props pass him on their way to market. He sees cattle grazing in the aspen and open mountain meadows and occasionally a band of sheep grazing on some distant hillside near timber line.

He may, perhaps, happen to run onto a group of cabins above a lake or on a sidehill, well concealed from traffic cut with a commanding view of a valley or a mountain range. A sign states that this cabin is occupied under special-use permit issued by the Forest Service. Upon inquiry the farmer discovers that he too may build and occupy a summer-home cabin and that many lots have been surveyed and are waiting for applicants. Possibly he may select a lot and build

a cabin, as many farmers have done. Each summer he may bring his family to this cabin which he can gradually fix up with the com-



FIGURE 64.—Los Angeles' Camp Seeley—the first municipal camp to be established in the national forests of California, San Bernardino National Forest



FIGURE 65.—Cabins at Los Angeles' Camp Seeley, San Bernardino National Forest

forts of home so that he can enjoy a real rest and vacation without the hardships and uncertainties of camp life.

F. R. JOHNSON,
Technical Assistant, Forest Service

Feed Marketing Has Changed Materially in Last Six Years

Many changes have occurred in the marketing of feed with the reorganization of general business during the past six years. These changes have pertained particularly to the manner of commodity merchandising and distributing. The method of marketing mill feeds has not escaped this change in the order of things.

Prior to about 1922-23 by far the bulk of the output of mill feeds was handled through jobbers and brokers in producing markets, who, in turn, sent these feeds on through jobbers and brokers in distributing markets. That is, flour mills, flax crushers, corn mills, etc., were primarily interested in disposing of their principal manufactured product; disposal of their by-product feeds was looked upon more or less as a side issue. By-product feed was virtually turned over to the jobbing trade and no particular endeavor was made to send it in smaller parcels direct to the country dealer, distributor, or mixed-feed manufacturer.

With more intense competition between flour manufacturers and with the changes incident to the use of more modern methods of manufacturing, merchandising, and distributing their principal product, the mills gradually began to show as much careful business interest in disposing of their by-products as they did with the flour. Salesmen who were previously often instructed to confine their efforts to selling flour, were instructed to sell feed as well and to push feed sales in an endeavor to get as much tonnage booked direct to the flour and feed dealer as possible.

Influence of the Mixed-Feed Industry

Growth of the mixed-feed industry is another important factor in the changing situation. Feeders, generally speaking, have gradually made a more careful study of the problems of animal nutrition, and a larger and more steady demand has developed for balanced feed rations and mixtures in which by-product feeds may be profitably used. Although mixed-feed plants have always used large tonnages of wheat mill feeds, it was formerly customary for them to obtain their supplies chiefly from the jobbing trade, as the jobbers both in producing and distributing markets usually had bought up the bulk of the mill output for the season. As flour mills realized that a large percentage of their by-product output eventually found its way to the mixed-feed plants, they began catering to this business direct. Soon mixed-feed manufacturers were offered feed by mills on a more attractive basis than they could obtain from the jobber. Among the reasons were the facts that the credit risks were better, shipping instructions were more likely to be furnished as needed, and in most cases feed sold direct to the mixed-feed manufacturer would be taken off the resale market.

With the growth in demand for mixed feeds, flour mills began to manufacture commercial mixed feeds on a large scale. This has curtailed the tonnage of wheat mill feeds placed on the open market. Mills entered this new activity by remodeling their facilities to meet the mixed-feed trade requirements and in some instances, they purchased outright some of the larger mixed-feed companies and merged them with their own concerns.

Development of cooperative buying agencies, who have directed their inquiries directly to mills, has also been an important factor in causing this change in the channel of distribution. Formerly coop-

erative buying agencies, particularly those that were farmer-and-feeder controlled, were small and they directed their inquiries to their local jobber or wholesale feed dealer. Many of these agencies are now large organizations and they obtain their feed direct from mills whenever possible.

Establishment of buying agencies by large handlers of mill feeds has also made for more direct contact with mills. Many of the larger distributors and feed manufacturers now have their own buying agents at main producing markets who are in daily contact with mills. In this way they buy much of the feed direct that previously went through the jobbers' hands.

Many feed manufacturers, as well as wholesale flour and feed dealers, have established chain stores for the distribution of their feed, flour, and allied commodities. In many instances the chain-store unit has supplanted the local retail feed merchant, who previously bought the bulk of his requirements from a near-by distributing wholesaler, or from a jobber. Now, with one organization buying for an entire chain, this business is directed so far as possible to the manufacturer.

Mill by-product feeds have merely followed the trend that has taken place in practically all lines of commercial endeavor; that is, to put the commodity at its ultimate destination via the shortest route.

W. R. KUEHN,
*Associate Marketing Specialist,
Bureau of Agricultural Economics.*

FEEDS for Livestock For centuries livestock lived mainly May Sometimes Require by shifting for themselves. At Special Preparation times some received harvested feed to help carry them through the winter, but the chopping or grinding of roughages for livestock was unheard of and the milling of grain was a slow, laborious process limited to grain for human consumption. Fattening livestock with grain on an extensive scale began, in the United States, with the settlement of the eastern part of the Corn Belt, early in the nineteenth century.

For many years shock corn was the mainstay of the feed lot. The first step in feed preparation was the breaking of ear corn. During much of the latter part of that century corn was so cheap that there was little or no incentive to use the by-products of flour and oil mills and packing houses.

Soaking, Cooking, and Grinding

Then as feeding became more largely a farm than a range operation, a strong demand developed for ways of getting more value from the feed. Soaking, cooking, and grinding were tried. In general, the extra labor added much to the cost of the feed and sometimes the feed was even less valuable on account of the process.

As soaking is a disagreeable job and renders some feeds less palatable, besides increasing the possibilities for spoilage, it has proved to be, on the whole, an undesirable method of preparing feed. It may be used, however, for small or flinty grains when grinding is not practicable.

Cooking adds to the palatability of many feeds but it is generally quite expensive on account of the equipment, fuel, and labor required, and is therefore a wasteful practice. Consequently, it is recommended only in exceptional cases, such as with potatoes and beans for hogs.

Grinding does not increase the digestibility or nutritive value of

feeds which can be thoroughly masticated. However, small hard-coated grains, such as rye, wheat, barley, and grain sorghums, should be ground or rolled. As the purpose of grinding is to break the outer seed coats, which resist the digestive and assimilative processes, coarse grinding or rolling is preferable to fine grinding. Finely ground grain is objectionable for the following reasons: Its grinding requires much more power than is required for coarse grinding, it heats and spoils readily in the bin, thus becoming less palatable and nutritious, and it has a tendency to form a pasty mass during digestion.

The grinding of grain may be justified also for livestock having poor teeth, for horses doing extremely hard work, and for cows producing milk in large quantities.

In fattening cattle, if ear corn makes up a large part of the ration, many whole kernels may pass through the digestive tract. In such cases putting hogs with the cattle is generally more economical than grinding the grain. (Fig. 66.)

Quality and palatability determine to a large extent whether roughage should be ground or chopped. If hay is of such good quality that practically all of it is readily eaten, there is no appreciable advantage in putting it through a mill. (Figs. 67 and 68.) Much hay is

so stemmy that a large percentage of it, principally the stems, is not eaten by livestock unless they are starved to it. As such measures are rarely profitable, grinding or cutting may be employed to make all parts of the hay edible. Such procedure is profitable when the value of hay saved is greater than the cost of grinding.

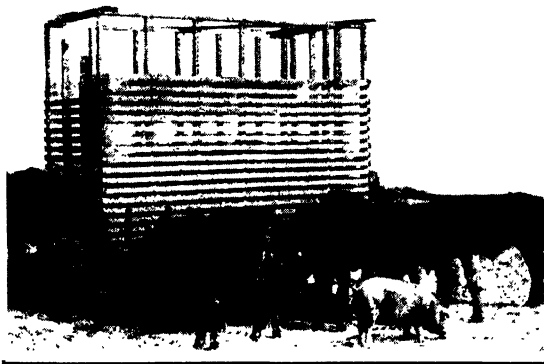


FIGURE 66.—Saving labor by fattening steers on ear corn in a self-feeder. Hogs utilize the waste feed, including that in the cattle droppings

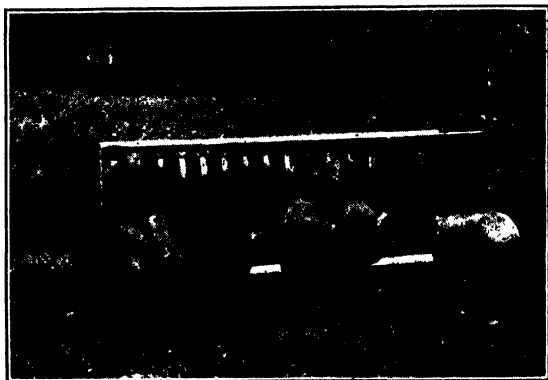


FIGURE 67.—Alfalfa hay fed to brood sows adds bulk to the ration and is an excellent source of protein, minerals, and vitamins

Costs of Cutting and Grinding Hay

According to several trials by the South Carolina Agricultural Experiment Station, the cost of grinding hay is \$2.21 a ton. It should be kept in mind, however, that the refused stems are much less valuable than the finer parts which are readily eaten. Several analyses indicate that alfalfa stems are about 50 per cent crude fiber. This puts them in a class with the straws which have such a low net energy value that they are fit for use only when a very low plane of nutrition is economical or when it is desired to increase the bulk of the ration. The dust incidental to grinding hay is very objectionable both at the time of grinding, on account of the danger of explosions, and also at the time of feeding, especially where milk is produced for human consumption. Chopping or cutting hay may produce appreciably less dust than grinding. At prevailing prices for labor, gasoline, and oil,



FIGURE 68.—Racks for feeding grain and fenced runways for feeding hay to lambs in Colorado

and exclusive of charges for depreciation and interest, hay may be cut with a tractor and silage cutter for about \$1.50 a ton.

In fattening steers on alfalfa, both alone and with other feeds, cut alfalfa hay produced greater gains than whole alfalfa hay and less of the cut hay was wasted, according to experiments of the Idaho and Oregon stations. Taking the greater gains and less waste into consideration, the cut hay was from 10 to 20 per cent more valuable than the whole hay, which, however, is not sufficient to offset the cost of cutting unless hay is worth \$15 a ton or more and can be chopped for about \$1.75 a ton. Corn stover and similar coarse roughages may be shredded to make the stalks more edible. Such treatment greatly facilitates the use of the refused parts for bedding and the subsequent removal and spreading of the manure.

Briefly, grinding or similar processes are most valuable in the case of grain which is too hard or too small for livestock to chew readily and thoroughly. Roughages should be ground, chopped, or shredded

when the consumption of the less desirable parts is increased sufficiently to make the operation profitable.

A. T. SEMPLE,
Associate Animal Husbandman, Bureau of Animal Industry.

FERTILIZER Applications That Show Most Profit Are Difficult to Make It has long been recognized that for any given crop, soil, and climate a certain rate of fertilizer application will be more profitable than any other. When more than the optimum quantity for a specified set of conditions is applied, the increased crop yield produced by it will not pay for the additional fertilizer and, if the excess is large, the yield is likely to be materially less than the maximum.



FIGURE 60.—Three units in the distributor shown at the top were partitioned off and calibrated to deliver the same weight of the same fertilizer. The amounts of the three different mixed fertilizers actually delivered show the effect of the properties of the fertilizer on delivery rate

Distributors often fail to deposit fertilizers uniformly and thus some plants may receive much more nutriment than the average, while others receive little or none. Therefore even though the best fertilizer is applied at the optimum quantity per acre the greatest benefits possible from the use of that fertilizer are usually not secured. For maximum profits the best fertilizer must be distributed uniformly

in the proper position in the soil in relation to the seed, and at the right rate.

With a fixed adjustment, the delivery rate of most distributors varies with the properties of the fertilizer. The highest delivery rates are obtained with fertilizers that flow best, and solid substances flow most freely when they are composed of spherical grains and are dry. On the other hand, with the same setting distributors generally deliver at a low rate when the material is damp, finely powdered, light in weight in proportion to its bulk or is composed of oblong particles. Thus when the implement is set to apply 800 pounds per acre of one material it is just as likely to distribute 500 or 1,200 pounds of another or of the same one if its "drillability" changes.

The properties of a fertilizer that influence its distribution rate are either inherent in the material or fixed in the process of manufacture, except its dampness. This property, however, varies constantly with changes in the humidity and temperature of the air in which the fertilizer is stored and is especially significant because the delivery rate diminishes rapidly with increasing dampness and when very damp most fertilizers become undrillable.

Methods of Applying Fertilizers

As a rule all that is desired in applying fertilizers is an approximation to a certain rate and this can usually be attained readily enough. When starting to apply fertilizers most farmers adjust their distributors by trial or according to the calibration chart and then change the adjustment from time to time until the rate of delivery appears satisfactory. A better method consists of calculating the desired weight of material for a given number of feet of row, and having tied a container beneath the distributor, operate it over that distance several times, making appropriate adjustments each time until the required rate is obtained. Having calibrated the machine in this way the fertilizer should be exposed to the air as little as possible as changes in the weather will cause it to absorb moisture from the air or to dry out and thus alter the delivery rate.

In practice, irregular distribution usually goes unobserved at the time, because the fertilizer is immediately covered with soil, but it may show up later as gaps in the row where seed were killed by too much fertilizer and as poor growth at other places where the plants received little or none.

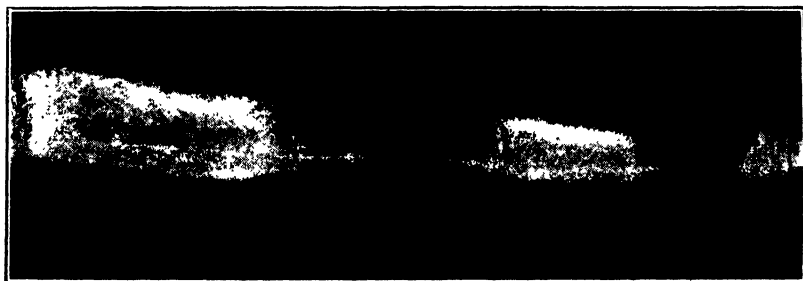


FIGURE 70.—A 20-foot section of row placed on a smooth floor showing the cycles of delivery produced by an augur-type distributor with fertilizer in good condition

Some types of distributors can apply dry, coarsely granular material with a fair degree of uniformity but most of them can not distribute damp material uniformly. Irregularity of distribution is at its worst when the fertilizer is damp, lumpy, finely powdered, or composed of very oblong, needlelike particles.

Implements with several delivery units frequently deliver at a different rate from each tube. Changing the depth of the material in the hopper and the tilt of the machine, as well as jolts and side swings all tend to vary the quantity of fertilizer being deposited.

In addition to the difficulties already mentioned some mixed fertilizers tend to separate during distribution. The jarring and swaying to which distributors are subjected and the incessant vibration of some hoppers, especially of the agitator and knocker types, cause the finer particles of fertilizer to sift down between the coarser ones, and the heavy grains to settle more rapidly toward the bottom of the hopper than the light ones. Thus the ratio of plant-food elements delivered may change from time to time.

Fertilizers Vary in Drilling Qualities

When purchasing fertilizer there is often an opportunity to choose between mixtures that are practically identical in plant-food content

and cost, but are very different in drilling qualities. In such cases it will pay well to choose the material that can be distributed best. Most fertilizer distributors do their best work with materials that are fairly dry, free from hard lumps and capable of pouring in a steady stream but which will not flow so freely as to sift through openings in the hopper when the implement is idle.

When such a material is poured slowly into a conical heap the slope of the sides of the pile will make an angle with the horizontal of about 40° . This angle increases with decrease in drillability and most implements fail to distribute satisfactorily materials giving an angle greater than 50° when tested in this way. Mixtures that tend to separate into their components may be detected by half filling a fruit jar and shaking it for a few minutes.

Having purchased a fertilizer of good drillability, it is wise to keep it in that condition. This may be done by storing it in a dry place, preferably on a wooden floor above the ground level, until ready for application. Fertilizers usually become less drillable when stored in the field, as is now often done in certain sections, or in a damp place, or on the ground. If a fertilizer becomes damp in storage it should be dried before distributing it, by spreading it in a thin layer on boards or canvas in the sun and if it becomes lumpy it should be screened, the lumps broken up and then remixed. These procedures are irksome, require much time and labor, and ought therefore to be avoided by proper care in the first place. The humidity of the air is usually lowest from noon until 4 p. m. of sunny days and damp fertilizers dry best and can be most efficiently distributed at such times, although it may not be practicable to limit the work in this way. The points considered above apply to concentrated fertilizers as well as the ordinary fertilizers now generally used.

ARNON L. MEHRING,

Associate Chemist, Bureau of Chemistry and Soils.

FERTILIZER Distributor Operation Affected by Many Conditions

The maximum benefit from the application of commercial fertilizers to field crops is to be obtained only when the fertilizer is distributed uniformly at the predetermined rate. The distribution of fertilizers by machine varies with the type of distributor, and is greatly affected by the changing conditions of field operation. Fertilizers in poor condition tend to flow in lumps, and are distributed more or less irregularly by all machines. Fertilizers that flow with exceptional freedom usually give the most uniform distribution, but may be distributed unevenly by certain machines since they respond readily to mechanical irregularities. Any irregularity in the design, construction, or movement of the dispensing member causes impulses of delivery, and several times as much fertilizer may be deposited during one interval as during another. Figure 71 illustrates extremely irregular distribution as sometimes found, while Figure 72 shows the subsequent effect on the growth of plants. Uniform distribution, being most difficult to obtain at the lower delivery rates, is of increasing importance since the trend seems to be toward the use of more concentrated fertilizers.

A number of distributors are so constructed that a fertilizer in good condition will flow by gravity through the distributing mechanism

when not in motion, which may result in the wasting of considerable fertilizer. To obviate this difficulty, some machines are equipped with a flap for readily covering the discharge opening. Distributors having multiple units, such as a grain-drill attachment, do not always discharge equal amounts of fertilizer from all units. When the machine as a whole may be giving the desired rate of application, in extreme cases some rows will receive twice as much fertilizer as others. The usual causes of this variation are differences in the size of the quantity-regulating gates, loose connections in the adjusting mechanism, and partial clogging due to caking of the fertilizer. The operator should examine his machine frequently, to correct any of these faults as soon as they occur. When two or more delivery tubes extend from the same unit, considerable variation in delivery may result. Not only may the quantity delivered by individual tubes differ, but also, because of segregation in the distributing mechanism, the proportions of large and small particles may be different.

Depth of Fertilizer in Hopper

The decrease in the depth of fertilizer in the hopper during operation causes a decrease in the delivery rate, especially with a fertilizer that flows very freely. Delivery rate is affected most when the depth of fertilizer is less than the width of the hopper at the discharge opening. Therefore, the hopper should not be completely emptied before it is refilled. In top-delivery types of distributors, depth of fertilizer affects the delivery rate only by compacting the material; the amount of compacting will vary according to the texture of the fertilizer, and usually will be small.

The rate at which distributors that are not entirely positive in their action discharge fertilizer at any particular adjustment is greatly affected by the physical condition of the fertilizer. A majority of the distributors now used are of such types that the delivery rate will be affected materially by changes in the condition of the fertilizer. Since the condition of fertilizer as ordinarily stored is affected by the weather, it may be necessary to change the adjustment of the distributor frequently to maintain the desired rate of application. The use of efficient agitators in the hopper helps to keep the delivery rate constant.

It is not uncommon for a distributor adjusted to deliver 200 pounds per acre of one fertilizer to deliver 400 pounds per acre of another fertilizer of equal drilling qualities. This results from a difference in the weight per unit volume, which varies greatly among fertilizers. The adjustment chart sometimes attached to the machine by the manufacturer is intended only as an approximate guide, for it does not take into consideration either the weight or the condition of the fertilizer. The



FIGURE 71.—Irregular distribution of a fertilizer in excellent condition resulting from characteristics of design of the distributing machine

operator should test his distributor with each lot of fertilizer received, and check the rate of delivery frequently when much time is required for the application.

Inclining the machine from its normal operating position, as is the case in traveling over sloping ground, affects the delivery rate in most distributors, particularly with free flowing fertilizers. The 1-wheel distributors most commonly used are many times inclined rearward toward the discharge opening by permitting the covering shovels to run too deep. This may more than double the delivery rate with some distributors. If the inclination is away from the discharge opening, the delivery rate will be decreased. Inclination has the least effect on

those types of distributors that discharge the fertilizer in a circular band about the hopper, through an opening in the center of the hopper base or from the top of the hopper.



FIGURE 72.—Uneven growth of cotton plants resulting from irregular distribution of the fertilizer

Slippage of Drive Wheels

Rate of delivery also depends upon the slippage of the drive wheels of the distributor. The slippage of the smaller wheels, approximately 15 inches in diameter as used on walking machines, varies from 5 to 40 per cent depending upon the width and design of the tire, the power required to turn the wheels of the machine, and the character of the seed bed. The slippage of wheels 30 inches or more in diameter is

much less, and seldom exceeds 15 per cent. Keeping the machine well lubricated and the operating parts clean will reduce slippage.

Among the features of construction that would facilitate the management of distributors are (1) large hoppers and delivery tubes, (2) a graduated or notched scale on the quantity-adjusting device, (3) provision for making comparatively small changes in the delivery rate, (4) means of readily determining the delivery rate, (5) accessibility of the parts for easy emptying and cleaning, and (6) protection of the metal parts from rust and corrosion. To secure most satisfactory operation of a distributor, care should be observed to (1) examine the machine frequently and see that the distributing mechanism is clean and that all parts are in adjustment and well lubricated, (2) adjust the regulating gates according to the kind of fertilizer being used, (3) readjust the regulating gates according to the physical condition of the fertilizer, (4) refill the hopper before the depth of fertilizer becomes small enough to affect the rate of delivery, (5) check the rate of delivery frequently, (6) keep the distributor as nearly level as possible while applying fertilizer, which requires special attention with 1-wheel

machines, and (7) empty the machine entirely at the end of each day's work, to prevent caking of the material and clogging and rusting of the distributing mechanism due to absorption of moisture by the fertilizer.

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FERTILIZER Materials for Cotton Growing Must be Well Chosen. Considerable care should be employed in the selection of the soil to be planted to cotton and in the use of commercial fertilizers. Faced by the necessity of having to increase the yield and quality of cotton and lessen the cost of producing the crop, it is self-evident that the selection of desirable soils and the use of the right fertilizers become matters of economic importance.

The use of fertilizers has long been recognized as an especially important factor in cotton production in the Southeastern States. In 1928 there were planted in North Carolina 1,919,000 acres of cotton, and commercial fertilizers were used on 99 per cent of the area, the average application being 440 pounds per acre at a cost of \$6.38 per acre; in South Carolina there were planted 2,479,000 acres and 94 per cent of the area was fertilized, the average application being 325 pounds per acre at a cost of \$4.44 per acre; in Georgia there were planted 3,874,000 acres and 96 per cent of the area was fertilized, the average application being 262 pounds per acre at a cost of \$3.86 per acre; in Alabama there were planted 3,706,000 acres and 93 per cent of the area was fertilized, the average application being 262 pounds per acre at a cost of \$4.22 per acre.

Investigations by the Department of Agriculture and the State experiment stations in the Southern States have played an important part in furthering the proper use of commercial fertilizers on the cotton crop. Experiments conducted by the department deal with the nutrition of the cotton plant, its response to different forms of nitrogen and potash, to varying quantities of fertilizers, and a study to determine the ratio of nitrogen, phosphoric acid, and potash suitable for cotton on prominent soil types. Most soils used for cotton growing require for normal growth and development, including abundant boll formation and early maturity, a complete fertilizer containing a well-balanced proportion of nitrogen, phosphoric acid, and potash, the formula and fertilizer materials to use depending in large measure on the type of soil.



FIGURE 73.—Cotton in fertilizer experiment on Norfolk sandy loam. Cotton on left received 900 pounds per acre of a fertilizer containing phosphoric acid and potash and no nitrogen; yield 876 pounds per acre. Cotton on right received 900 pounds per acre of a fertilizer containing phosphoric acid, potash, and 4 per cent nitrogen; yield 1,263 pounds per acre

Principal Sources of Nitrogen for Fertilizer

Sodium nitrate and sulphate of ammonia are the principal inorganic sources of nitrogen materials used in fertilizing cotton. Both are used in mixed fertilizers and may be used alone as side dressing after the cotton is up. Cottonseed meal, fish scrap, dried blood, and tankage are the principal organic materials used. Since the World War a number of synthetic nitrogen salts have become available for fertilizer usage. The principal synthetic nitrogen salts which have been suggested for fertilizer purposes are chiefly urea, ammonium phosphate, ammonium chloride, potassium nitrate, potassium ammonium phosphate, ammonium nitrate, potassium ammonium nitrate, and salts containing two or three plant-food constituents. In addition to these quite a number of commercial materials have been introduced, such as Leunasalpeter, Nitrophoska, Ammophoska, Calurea, Leunaphos, Leunaphoska, and others.

Experiments conducted for several years on 12 soil types in North Carolina and South Carolina show the synthetic nitrogen salts to be good sources of nitrogen for fertilizing cotton when compared with equivalent amounts of nitrogen in nitrate of soda and sulphate of ammonia. The average yield of all the experiments for the various materials used in mixtures with phosphoric acid and potash are given in Table 8.

TABLE 8.—Comparative effects of nitrogen carriers on yield of cotton

| Source of nitrogen in fertilizer | Yield of seed cotton per acre | Source of nitrogen in fertilizer | Yield of seed cotton per acre |
|----------------------------------|-------------------------------|----------------------------------|-------------------------------|
| | <i>Pounds</i> | | <i>Pounds</i> |
| Nitrate of soda..... | 1,266 | Ammonium phosphate..... | 1,221 |
| Sulphate of ammonia..... | 1,263 | Urea..... | 1,210 |
| Ammonium nitrate..... | 1,248 | | |

The more slowly available organic nitrogen materials are not suitable as the sole source of nitrogen in mixed fertilizers for cotton. They do not supply enough quickly available nitrogen in the early spring when the young plants need stimulation, but furnish it later in the season, which delays fruiting and maturing of the cotton. Nitrogen from organic sources may be used in mixed fertilizers with inorganic or synthetic materials to advantage, especially for sandy soils of the coastal plains. Experiments made on nine soil types on the coastal-plain soils of South Carolina show that better results were secured from a fertilizer containing nitrogen derived in part from inorganic sources and in part from organic sources than from fertilizers in which all the nitrogen was of inorganic source.

Superphosphate is used almost exclusively as the source of phosphoric acid in mixed fertilizers for cotton. It is a quickly available source of phosphoric acid. Ground rock phosphate and basic slag are used to a minor extent, but these materials are applied singly and not in mixtures with nitrogen and potash carriers.

Several potash materials are used in cotton fertilizers, the principal ones being sulphate of potash, muriate of potash, kainit, and manure

salts. Results of experiments made for several years on 12 soil types on the coastal-plain soils and on 6 soil types in the piedmont region in North Carolina and South Carolina are shown in Table 9. Sulphate of potash, muriate of potash, and kainit sources of potash in complete fertilizers with superphosphate and nitrogen carriers were applied at the rate of 900 pounds to the acre.

TABLE 9.—*Comparative effect of potash carriers on yield of cotton*

| Source of potash in fertilizer mixture | Average yield of seed cotton per acre on — | |
|--|--|------------------|
| | 12 coastal-plain soils | 6 piedmont soils |
| Sulphate of potash..... | Pounds 1, 231 | Pounds 937 |
| Muriate of potash..... | 1, 210 | 939 |
| Kainit..... | 1, 135 | 892 |

There was not a great variation in yield produced by the sulphate and muriate of potash. Kainit gave somewhat lower yields. The forms of potash have not shown wide variations in yields in these tests.

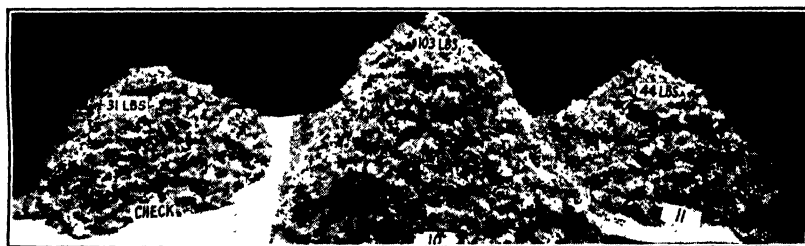


FIGURE 74.—Yield of cotton on Norfolk sandy loam ($\frac{1}{2}$ -acre plots). (Check) Received no fertilizer, yield 620 pounds per acre; (10) received 900 pounds per acre of fertilizer, containing nitrogen, phosphoric acid, and potash, yield 2,060 pounds per acre; (11) received 900 pounds per acre of a fertilizer containing phosphoric acid and potash and no nitrogen, yield 880 pounds per acre

Experiments on Fertilizer Formulas

The Department of Agriculture and the southern experiment stations have conducted numerous field experiments on a large number of soil types to determine the proper fertilizer formula, and from a digest of these results the following conclusions may be drawn.

On the gray sandy loam soils of the coastal plains occurring in the extreme northeastern section of the Cotton Belt including southeastern Virginia and northeastern North Carolina, which normally produce a rank vegetative growth making early maturity an essential factor, a mixture should be used containing 4 per cent nitrogen, 12 per cent phosphoric acid, and 4 to 6 per cent potash. On the lighter soil types in this region where vegetative growth is inclined to be less vigorous, a mixture containing 6 per cent nitrogen, 10 per cent phosphoric acid, and 4 to 6 per cent potash gives best results.

In the case of the heavy clay loam and sandy loam soils of the central coastal plain section, including eastern North Carolina and eastern South Carolina, which normally produce rank vegetative growth,

making early maturity an essential factor, a mixture containing 4 per cent nitrogen, 10 per cent phosphoric acid, and 4 per cent potash is suitable. On the lighter sandy and sandy loam soils of the region, in order to stimulate vegetative growth, a mixture containing 4 to 5 per cent nitrogen, 8 per cent phosphoric acid, and 3 to 4 per cent potash is recommended. On the lighter sandy types of this region from 18 to 30 pounds of nitrogen per acre from materials containing nitrogen in readily available form should be used after the cotton is up.

For the clays and clay loams of the piedmont section of North Carolina, South Carolina and Georgia a mixture containing 4 to 5 per cent nitrogen, 10 per cent phosphoric acid, and 2 to 3 per cent potash gives good results. The sandier types of this region do better with mixtures containing 4 to 5 per cent potash. On the less fertile soils of this region it is considered a good practice to use from 18 to 30 pounds of nitrogen per acre from readily available materials, after the cotton is up.



FIGURE 75.—Representative bolls of cotton grown on soil responding to potash. A, Fertilizer contained 3 per cent ammonia, 9 per cent phosphoric acid, and no potash; B, fertilizer contained 3 per cent ammonia, 9 per cent phosphoric acid, and 3 per cent potash; C, fertilizer contained 3 per cent ammonia, 9 per cent phosphoric acid, and 6 per cent potash

On the coastal plain soils of Georgia, particularly the heavy, dark, pebbly soils of the Tifton series, a mixture containing 3 per cent nitrogen, 9 per cent phosphoric acid, and 5 per cent potash can be recommended; the gravelly sandy soils of the Norfolk series will respond well to a mixture containing 4 per cent nitrogen, 8 per cent phosphoric acid, and 4 per cent potash; and the red and brown soils of the Greenville and Orangeburg series to a mixture containing 4 per cent nitrogen, 10 per cent phosphoric acid, and 4 per cent potash. On the light porous sandy soils of this region the use of 18 to 20 pounds of readily available nitrogen per acre should be used at the first cultivation of cotton after chopping.

The most profitable quantity of fertilizer to apply also varies with the soil type and farming conditions. On the coastal plain soils applications vary from a very small quantity up to 900 pounds to the acre. In a large number of tests conducted by the department applications of 800 pounds to the acre have been found profitable. On the soils of the piedmont less fertilizers are used where applications of from 600 to 800 pounds to the acre have been found the most profitable.

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FERTILIZER'S Value Measured in Tests in North Carolina

Some methods of increasing yields per acre, such as the adaptation of crops to soil types, the rotation of crops and the use of improved varieties of seed, involve no additional costs; others require increased expenditure, as spraying for insect control, better preparation of soil and cultivation of crop, and application of fertilizers. Often without this extra expenditure no profit can be made, if indeed an actual loss does not result.

So many factors are involved in growing a crop that well-planned experiments are necessary to determine the effect of fertilizers. As an example of the increased yields obtained from fertilizer, experiments under controlled conditions on cotton conducted by the North Carolina Experiment Station in cooperation with the United States Department of Agriculture may be cited. On Portsmouth sandy loam

the check-plot yield was 588 pounds of seed cotton; 150 pounds of fertilizer increased the yield 199 pounds and 900 pounds of fertilizer increased it 952 pounds. On another type of soil 800 pounds of fertilizer increased the yield 834 pounds. This would indicate that at these applications for 1 pound of fertilizer used approximately 1 pound of seed cotton was obtained. The curves shown in Figure 76, however, constructed from data in the North

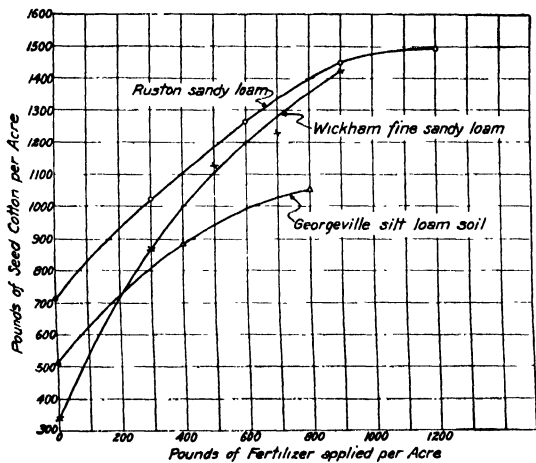


FIGURE 76.—Curves showing relation of seed-cotton yield to amounts of fertilizer applied

Carolina report, show slightly diminishing increases with increasing amounts of fertilizer applied. The increased yield, for example, from 300 pounds of fertilizer on Ruston sandy loam is 308 pounds and for the next 300 pounds of fertilizer is 240 pounds and for the third 300 pounds is 189 pounds. This illustrates the law of diminishing returns, which in practice means that fertilizers can not be applied indefinitely in increasing amounts with profit, since the increases derived from successive amounts become smaller. In the great majority of cases, however, the applications of fertilizers are too small to produce the maximum profit from their use. The data given above show that the use of land has been more effective, since with fertilizers applied crops were obtained two to four times as large as on the same area of unfertilized land.

Fertilizers Save Labor

The fact that fertilizers increase unit land production would indicate that labor also is conserved by its use. This is found to be true if the labor required to produce certain crops is considered. In a survey of labor requirements it has been found that on an average 19 hours of labor are expended per acre for harvested corn, 11.7 hours for

TABLE 10.—*Increased labor efficiency from use of fertilizers as indicated by average yields obtained in long-time experiments on fertilized and unfertilized plots*

| Crop | State | Yield per acre on -- | | Average hours of labor per acre | Yield per hour of labor on— | | Increased labor efficiency |
|-------------|---------------------|----------------------|---------------------|---------------------------------|-----------------------------|---------------------|----------------------------|
| | | Unfertilized plots | Fertilized plots | | Unfertilized plots | Fertilized plots | |
| Wheat..... | Missouri..... | <i>Bushels</i> 12.5 | <i>Bushels</i> 30 | 11.7 | <i>Bushels</i> 1.07 | <i>Bushels</i> 2.53 | 140 |
| Do..... | Ohio..... | 11.5 | 28 | 11.7 | .98 | 2.39 | 143 |
| Corn..... | do..... | 27.2 | 46.6 | 19 | 1.43 | 2.45 | 71 |
| Oats..... | do..... | 31.9 | 61.2 | 13 | 2.45 | 3.94 | 61 |
| Cotton..... | Mississippi..... | <i>Pounds</i> 691 | <i>Pounds</i> 1,096 | 128 | <i>Pounds</i> 5.4 | <i>Pounds</i> 8.56 | 59 |
| Do..... | South Carolina..... | 1,321 | 1,816 | 128 | 10.3 | 14.2 | 38 |

wheat, 13 hours for oats, and 128 hours for cotton. In Table 10 are given results of long-time experiments of several State experiment stations on fertilized and unfertilized plots. The use of fertilizer indicates an increased labor efficiency of about 140 per cent for wheat, 71 per cent for corn, 60 per cent for oats, and 40 to 60 per cent for cotton on the assumption that the increased yields do not materially add to the hours of labor necessary. This is not strictly true as harvesting labor will be somewhat increased, but since preharvest labor, which is the largest part, is practically the same for a small or large yield, a distinct saving is made in the labor expenditure per acre.

Increased Profits from Fertilizer

The final criterion for the use of fertilizer is that it gives a profit. There are times when no profit will be realized even though fertilizers are employed. The absence of sufficient moisture for the crop, the uncontrolled ravages of insect pests, improperly selected crop or unsuitable soil or climate, and occasionally a very low price for a crop may so outbalance the benefits from fertilizer that its effect is diminished or lost. Under conditions suitable for normal growth, however, there is overwhelming evidence that the use of sufficient fertilizer will give a profit. As an illustration, in Table 11 are given data on cotton compiled from statistics gathered by the Department of Agriculture. The arrangement is by yield groups of pounds of lint cotton per acre.

TABLE 11.—*Cost per acre of producing cotton as related to cost of fertilizers*

| Yield group (pounds of lint) | Average yield | Total cost | Net cost of lint per pound | Fertilizer cost | Total value of crop | Net profit |
|------------------------------|---------------|----------------|----------------------------|-----------------|---------------------|----------------|
| | <i>Pounds</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| 20 and under..... | 14 | 21.09 | 1.45 | 2.94 | 6.02 | -16.07 |
| 21 to 60..... | 44 | 26.96 | .55 | 4.25 | 15.42 | -11.54 |
| 61 to 100..... | 89 | 29.91 | .30 | 3.97 | 30.15 | +0.24 |
| 101 to 140..... | 124 | 32.52 | .22 | 3.39 | 41.61 | 9.09 |
| 141 to 180..... | 161 | 34.30 | .17 | 3.55 | 54.52 | 20.22 |
| 181 to 220..... | 200 | 38.77 | .16 | 4.48 | 67.93 | 29.16 |
| 221 to 260..... | 245 | 42.33 | .13 | 5.04 | 82.31 | 39.98 |
| 261 to 300..... | 280 | 47.24 | .12 | 6.27 | 98.77 | 51.53 |
| 301 to 340..... | 324 | 58.29 | .14 | 9.03 | 107.98 | 49.69 |
| 341 to 380..... | 356 | 55.40 | .12 | 8.75 | 119.76 | 64.36 |
| 381 to 420..... | 401 | 59.35 | .11 | 10.41 | 139.20 | 79.85 |
| 421 to 460..... | 444 | 64.76 | .11 | 9.99 | 145.16 | 80.40 |
| 461 to 500..... | 495 | 67.01 | .10 | 9.73 | 168.36 | 101.35 |
| Over 500..... | 618 | 83.00 | .09 | 13.86 | 223.62 | 140.62 |

Similar data on corn, wheat, and potatoes show the same general characteristics. The lowest expenditure for fertilizer is in the lowest yield group and the highest expenditure in the highest yield group. The net profit per acre, shown in the last column, is closely related to the expenditure for fertilizer, or, in general, as the expenditure for fertilizer increased the net profit increased. The group with an average yield of 124 pounds is the lowest to show a profit, one of \$9.09 per acre, with an expenditure of \$3.39 for fertilizer. The highest yield group has the highest expenditure for fertilizer and shows the largest profit, a yield of 618 pounds, fertilizer expenditure of \$13.86, and profit of \$140.62. With the fertilizer expenditure increased about 4 times the profits are increased over 15 times.

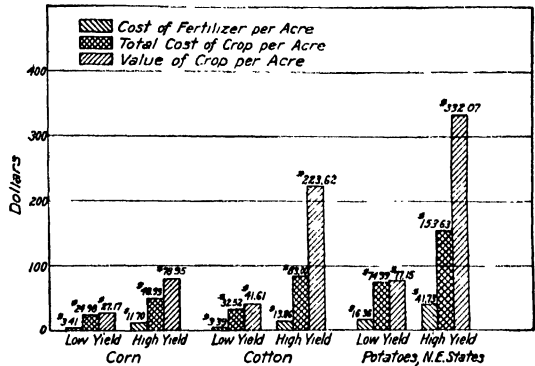


FIGURE 77.—Relation of cost of fertilizer per acre to total cost and value of crop in low and high yield groups

Heavy Fertilizer Applications Profitable

If the average price paid for fertilizer is used for converting the expenditure per acre to pounds of fertilizer applied, it is found that the applications ranged from 181 pounds per acre in the lowest group to 853 in the highest. This would indicate that the heavy applications are much more profitable. The chart in Figure 77 shows the relation of cost of fertilizer per acre to the total cost of the crop and the value of the crop. It indicates this for the lowest-yield group that showed a profit, and for the highest-yield group. Since the expenditure is in proportion to the quantity of fertilizer used the advantage of heavy applications is evident. This relation is also shown in

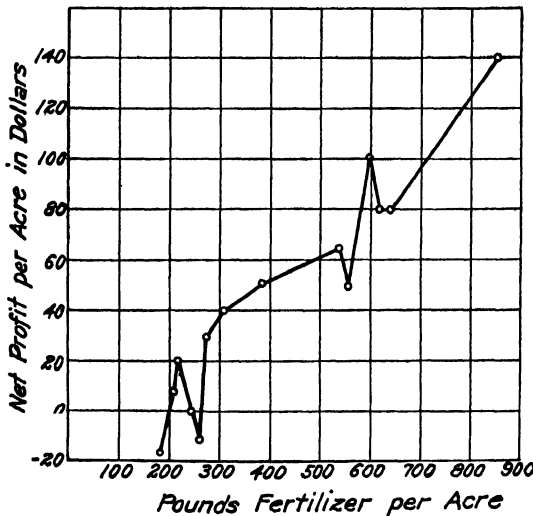


FIGURE 78.—Curve showing relation of net profit per acre to amount of fertilizer applied on cotton

Figure 78, where the net profit and pounds of fertilizer of Table 11 are plotted as coordinates.

In considering Table 11 and Figures 77 and 78, it must be remembered that these results are obtained from average figures of a number

of States during one season and so must be regarded as illustrative rather than as absolute values. Other seasons show corresponding but not identical relations, due to other factors entering into the net profits derived from a crop. Results obtained from many seasons on various crops show that fertilizers should be considered not as an added expense in the production of a crop but as a method of utilizing the soil more effectively, of reducing the costs of labor, and as an investment increasing the net profit per unit of crop and of land.

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FOOD and Drugs Imported Are Tested at Ports for Purity and True Labeling

Many of the foods that come to our tables, and large quantities of the drugs that are in daily use to combat disease, reach our shores from foreign countries. All such imported products are subjected at our ports to rigid physical and chemical tests to determine their purity and the truthfulness of their labels. Those that are found to be adulterated or misbranded within the meaning of the Federal food and drugs act are immediately detained and ordered to be exported or destroyed, or, under some circumstances, are permitted to enter after rebranding or after otherwise being brought into compliance with the law.

The Food, Drug, and Insecticide Administration maintains chemical laboratories and corps of inspectors and chemists at all of the principal ports of entry of the United States to make the necessary tests of purity. The heads of these laboratories are given the authority, in cooperation with the customs officials, to exclude from the United States all products that are in violation of the food and drugs act. It is because of this inspection that the foods and drugs that come to our homes from foreign countries are pure and unadulterated. Although the interstate features of the enforcement of the food and drugs act will not be considered in this article, it should be remembered that domestically produced foods and drugs are under the same strict control as that applied to imported foods and drugs.

Port Inspection of Spices

Spices come to the United States from the four corners of the world, and port inspections invariably detect any lots of impure or adulterated spices when offered for entry. From June 1, 1928, to May 31, 1929, the Food, Drug, and Insecticide Administration's laboratories throughout the country detained at ports of entry about 5,000,000 pounds of spices. The chief faults found with the spices denied entry were excessive dirt and sand in anise, cumin, dill, fennel, mace, marjoram, and pepper; excessive stems in cloves; excessive moldy products in cassia, chilies, capsicum, ginger, and nutmegs; excessive wormy material in capsicums, coriander, ginger, mace, nutmegs, and turmeric; exhausted seeds in anise and cardamoms; and added foreign oil in ground paprika. Because of the exclusion of the impure spices, only lots that are sound, clean, wholesome, and pure reach American dealers and these give flavor and piquancy to the foods with which they are mixed. So well is it known the world over that the Department of

Agriculture's experts at American ports will not pass spice products unacceptable under American laws, that, when American orders are being filled by foreign merchants, the choicest products grown under the tropical sun are selected.

Cocoa beans, from which our chocolate, cocoa, and chocolate confections are made, come to us from Africa, the West Indies, and South America. Imports of cocoa beans run into the hundreds of millions of pounds each year, the volume being greater than that of any other food product imported, except coffee. In years gone by the methods of harvesting and preparing cocoa beans for shipment, in the countries where grown, were such as to cause a large percentage of the crop to deteriorate, by becoming wormy or moldy, or both. Efforts have been made continuously to pass on to the United States—the greatest consuming country for cocoa beans in the world—beans which, because of their wormy and moldy condition, were unfit for food. The experts of the Department of Agriculture examine all shipments of cocoa beans offered for entry and refuse admission to those that are unfit. In 1928 more than 225,000 bags, each weighing 140 pounds, were refused admittance into the United States, and in previous years even larger quantities were excluded. These continued exclusions have had a tendency to bring about improved conditions of growing, drying, fermenting, handling, and packing of cocoa beans in the producing countries. They have had, moreover, a very decided effect in causing cocoa beans to be carefully sorted before being offered for shipment to the United States, with the result that in 1929 it was necessary to detain and exclude from the United States only about 20,000 bags.

Rejection of Figs Unfit for Food

Figs come to us from Turkey, Algeria, Italy, and Greece. They are also grown in California. When sound and free from insect and worm infestation, figs are a delicious fruit. They are, however, subject to insect infestation because of the prevalence in the growing countries of the fig moth, which deposits its eggs in the fruit, the eggs later producing larvæ. The fig is also subject to mold contamination. Unless figs are properly handled and cared for, they ferment and become sour. The Federal inspectors whose duty it is to watch the frontiers to protect the food supply of the Nation look for worms, for mold, for fermentation, and for sourness in figs, and refuse entry to unfit shipments. Last year more than 11,500,000 pounds of figs were refused entry into this country. This amount represented 50 per cent of all such products shipped to the United States.

Dates sold in the United States come largely from Mesopotamia, although considerable quantities are also grown in California. Dates likewise are subject to infestation with worms and with a small beetle and sometimes become moldy. During the period December 1, 1927, to November 30, 1928, agents operating under the Federal food and drugs act excluded more than 1,250,000 pounds of dates that were found to be unfit for use.

Although most of the confectionery consumed in America is of American manufacture, a very large aggregate amount is shipped to the United States by European nations. Most of this confectionery complies with our high standards of purity, but in the period July 1, 1928, to June 30, 1929, the Food, Drug, and Insecticide Administration

found it necessary to refuse entry to some 15,000 pounds of confectionery that was artificially colored with unpermitted or poisonous dyes, contained centers alleged to be composed of fruit but in fact consisted of artificially flavored imitations of fruit, contained alcohol, or was adulterated or misbranded in some other way.

Imports of Canned Products

Italy, France, Belgium, and Holland prepare large quantities of canned vegetables for the American market. Norway, Spain, Italy, and France send us large amounts of canned fish. England supplies us with many preserves. Shipments of such products must pass inspection before entering the commerce of the United States, and products unfit, unwholesome, impure, or falsely labeled, although often seeking entrance, do not succeed in passing the inspections and chemical tests applied to determine their suitability for consumption by American consumers. During the last year of which there is record more than 5,000 cases of canned fish and nearly 7,000 cases of canned vegetables were denied entrance at American ports.

Olive oil is uniformly inspected for purity and all shipments in any way adulterated or misbranded are excluded. Dishonest foreign shippers, who would flood this country with adulterated and spurious olive oil if they could, have learned by experience that it is unprofitable to attempt to practice fraud on the American people. When they try, their shipments are returned to them by compulsion, a costly experience, because of freight and handling charges. Consequently they seldom now send spurious products to the United States. During the last year the experts of the department found it necessary to exclude only a few thousand cases of edible oils of all kinds, representing less than 1 per cent of the total quantity shipped to the United States.

Medicines labeled with curative claims for all of the diseases to which the human family is heir come to our shores from foreign countries and knock for admittance, but find the doors securely locked whenever exhaustive tests show them not to contain drugs or drug combinations capable of producing the curative effects claimed. Over 3,000 lots of fraudulently misbranded medicinal preparations were denied entry during the last year.

Similarly, the food and drugs act sets a high standard for crude drugs. Over 8,000,000 pounds, representing a wide variety of crude drugs, were denied entry last year because they were adulterated. In addition, more than 1,500,000 gallons of cod-liver oil were detained because the product did not meet the test laid down in the Pharmacopœia, which is the official standard under the food and drugs act for all drugs named in it.

Pharmaceutical products, drug tablets, fluid extracts of drugs, and miscellaneous pharmaceuticals must invariably be pure, unadulterated, and in conformity with the strength declared on their labels, if they are to enter the United States for sale.

Wide Variety of Products Excluded

Among the numerous adulterated and misbranded foods and drugs excluded from entry into the United States under the food and drugs act during the last year reported were the following:

Beverages, including beverage sirups and materials, 10,000 cases; flour and meal, 200 bags; bread and cake, approximately 1,000 cases; alimentary pastes,

more than 1,000 cases; miscellaneous cereal products, about 100 cases; cocoa beans, about 20,000 bags; chocolate products, over 2,500 cases; coffee, about 3,000 bags; cheese, approximately 3,500 cases; dried milk, over 600 cases; cod-liver oil, 1,500,000 gallons; patent medicines, over 3,000 lots; crude drugs, over 8,000,000 pounds; frozen egg, over 1,000 cases; dried egg, approximately 300 cases; canned and other fish, more than 5,000 cases; canned and preserved fruits, over 1,500 packages; figs, 11,500,000 pounds; dates, 1,250,000 pounds; miscellaneous dried fruits, over 15,000 packages; jellies and jams, about 200 cases; olives, approximately 2,500 barrels; grains and stock feeds, about 1,000 bags; gelatin and meat products, in round figures, 6,700 packages; nuts, approximately 3,000,000 pounds; oils, in the neighborhood of 5,000 cases; confectionery, approximately 1,500 cases; sirups and other saccharin products, about 100 cases; canned shellfish, in the neighborhood of 1,500 cases; spices, approximately 5,000,000 pounds; canned vegetables, about 7,000 cases; dried vegetables, over 60,000 bags; vinegar, more than 100 cases; and table and mineral water, more than 3,000 cases.

The quantities listed really represent only a small percentage of the total coming to the United States. Roughly speaking, more than 95 per cent of the products offered for entry meet the requirements of the food and drugs act and are admitted. On the average, less than 5 per cent now fail to meet the terms of the law.

The effect of the application of import control under the food and drugs act to foods and drugs can not be measured in terms of actions taken or quantities detained and refused admittance. It should be remembered that the food and drugs act has been enforced for a long period and this enforcement has caused an improvement in the quality of products intended for American shipment, which improvement, as well as the permanent correction of the old forms of adulteration, has been made in the producing countries. Foreign merchants dealing with America know and appreciate in general what the requirements of the food and drugs act are. Their knowledge that this law is strictly enforced is an effective deterrent in preventing the shipment of inferior products to the United States.

Foreign Attitude on United States Law

Just what is the attitude of foreigners regarding our program and our activities in the interest of insuring a pure and unadulterated and honestly branded food and drug supply? Here are a few expressions quoted to give a cross-world view of the opinions of our method and actions in enforcing the food and drugs act.

Recently an exporter of figs from Turkey visiting the United States said to one of our experts:

The best qualities of figs are selected for United States delivery. We must send you the best of our crops, because you will not accept our poorer qualities. We have no trouble anywhere else in the world in selling the figs we produce.

A representative of a salvage association from London remarked, "Damaged lots of merchandise have a ready sale, but not in the United States." A cod-liver oil manufacturer from Norway tells us, "Your tests are uniformly correct. We do not dare ship anything but pure cod-liver oil to the United States." A Rotterdam merchant lately stated, "We take no chances in the American market with off-grade goods, for we know that they will not pass the barriers your food and drugs act has set up." A date packer from Bassorah, while on a visit to New York, told us, "America is our best market—for high-quality dates." A cocoa merchant from West Africa freely admitted, "Our lowest grades go to Europe; our best, to America." An exporter of pepper from Indo-China confessed, "We have no trouble with Government inspection anywhere in the world except in the United States.

There we find the operation of the food and drugs act continuously demanding clean and sound products."

According to a representative of the Bureau of Foreign and Domestic Commerce, United States Department of Commerce, who has traveled all over the world:

Two, and only two, United States laws are well known in foreign countries. One of these is the food and drugs act. Foreign peoples of every nation in the world have a profound admiration and respect for the methods employed and effects produced in the enforcement of the food and drugs act. The world knowledge of the efficiency of its enforcement causes foreign shippers to go straight in their American business, for fear of the consequences, and this same knowledge causes foreign consumers to have an implicit faith in foods and drugs of American manufacture.

To meet American requirements with respect to purity and proper branding of foods and drugs intended for American shipment, many governments have issued decrees and passed laws intended to prevent the adulteration or debasement of food and drug products intended for United States delivery, thus obviating the exclusions which are known to be sure to follow the offering of impure products for import into this country. Trade associations the world over are distributing copies of United States standards for foods and drugs, and American importers are buying under contracts containing guarantees that goods bought must meet such standards and must be guaranteed to pass Department of Agriculture port inspection. Scientific and commercial advisers are working throughout the world to eliminate forms of contamination, deterioration, and spoilage, which bar products from entry into the United States. Individual farmers, laborers, and workers of all kinds, the world over, are being taught the necessity for care in production, for discrimination in selection, for sanitation in handling, and for honesty of branding, because of the effect of the enforcement of pure food and drug laws in the interest of the consuming public in the United States. Buyers are learning the science of sampling and examining products to predetermine whether they will pass American inspection, and methods of sorting, cleaning, segregating, and selection are being introduced at all the centralizing points of the world from which foods and drugs are shipped, in order to yield products that will conform to our standards and pass our inspection.

W. R. M. WHARTON,
*Chief, Eastern District,
 Food, Drug, and Insecticide Administration.*

FORAGE-CROP Seed Imports Vary Much from Year to Year; Sources World-Wide

With the exception of timothy, the United States does not produce enough seed of the principal forage crops to meet the seed-ing requirements of the country. Depending on the size of the domestic crop, the carry-over from the previous year, and the size of the foreign crop, the quantity of each kind of seed imported varies greatly from year to year. Sixteen times as much alfalfa seed was imported in 1924 as in 1928; fifty-five times as much red-clover seed was imported in 1924 as in 1923; and more than twelve times as much orchard-grass seed was imported in 1929 as in 1928. On account of this wide difference in annual imports, any estimate of the important needs of the country can only be based on the total imports of a series of years.

In Table 12 are given the total imports for the 10-year period ended June 30, 1929, of the seeds subject to the Federal seed act. The quantities given in this table do not correspond with the previously published figures, as they have been adjusted to indicate as far as possible the country in which the seed was grown instead of the country from which it was shipped to the United States. In the main, the countries from which imports are drawn are determined by surplus production and price, as the importing country normally seeks its supplies in the lowest-priced world market.

TABLE 12.—*Forage-plant seeds permitted entry into the United States under the Federal seed act during the 10 years from July 1, 1919, to June 30, 1929*

[Quantities shown in hundredweights]

| Country | Alfalfa | Canada bluegrass | Alsike clover | Crimson clover | Red clover | White clover | Orchard grass |
|-----------------------|---------|------------------|---------------|----------------|------------|--------------|---------------|
| Argentina..... | 258,641 | | | | 168 | 66 | |
| Canada..... | 128,701 | 90,317 | 707,771 | 335 | 18,175 | 122 | 123 |
| Chile..... | 2,675 | | | | 27,031 | | |
| Czechoslovakia..... | | | 438 | 6,868 | 10,345 | 7,627 | |
| Denmark..... | | | 720 | 215 | 2,318 | 3,051 | 90,317 |
| England..... | | | 236 | 14,591 | 63,922 | 11,302 | 2 |
| France..... | 56,507 | | | 349,895 | 835,219 | 537 | |
| Germany..... | 5,145 | | 4,103 | 53,262 | 41,240 | 50,484 | 10,347 |
| Hungary..... | 1,107 | | | 33,665 | 8,294 | 681 | |
| Ireland..... | | | | | 223 | 375 | |
| Italy..... | 109,205 | | | 2,079 | 112,681 | 8 | |
| Japan..... | | | | | | 60 | |
| Latvia..... | | | | | | | |
| Netherlands..... | 1,497 | | | 246 | 4,456 | 2,108 | 591 |
| New Zealand..... | 300 | | | | 304 | 2,977 | |
| Poland..... | | | 720 | 629 | 42,054 | 35,528 | |
| Russia, Asiatic..... | 51,411 | | | | | | |
| Russia, European..... | | | | | 23,691 | | |
| Scotland..... | 1,208 | | 331 | | 2,124 | 1,679 | 1,116 |
| South Africa..... | 25,078 | | | | | 22 | |
| Sweden..... | | | | | | | 2,356 |
| Others..... | 18,799 | | | 16,157 | 12,152 | 480 | 332 |
| Total..... | 650,274 | 90,317 | 714,319 | 467,942 | 1,204,397 | 123,107 | 111,184 |

| Country | Rape | English ryegrass | Italian ryegrass | Halcy vetch | Spring vetch | All other forage crops | Total |
|-----------------------|---------|------------------|------------------|-------------|--------------|------------------------|-----------|
| Argentina..... | | | 5,810 | | | | 264,685 |
| Canada..... | 450 | 975 | 190 | 3,015 | 3,375 | 32,613 | 986,162 |
| Chile..... | | | | | | | 20,706 |
| Czechoslovakia..... | | | | 26,796 | 217 | 273 | 52,564 |
| Denmark..... | | 1,765 | 12,250 | 5,386 | 176 | 166 | 122,364 |
| England..... | 3,403 | 6,448 | 949 | 682 | 6,489 | 128 | 108,152 |
| France..... | 30,158 | 4 | 14,036 | | 1,234 | | 1,287,500 |
| Germany..... | 14,054 | 174 | | 126,272 | 36,648 | 469 | 348,198 |
| Hungary..... | 7,193 | | | 20,893 | | 764 | 81,597 |
| Ireland..... | | 111,763 | 35,862 | | | | 148,223 |
| Italy..... | | | | | | | 223,973 |
| Japan..... | 229,508 | | | | | | 229,628 |
| Latvia..... | | | | 40,367 | 14,517 | | 54,884 |
| Netherlands..... | 290,025 | 52 | 507 | 1,015 | 23,836 | 226 | 324,599 |
| New Zealand..... | 1 | 24,373 | 8,041 | | | 280 | 36,876 |
| Poland..... | 7,104 | | | 5,783 | 4,697 | 220 | 90,735 |
| Russia, Asiatic..... | | | | | | | 51,411 |
| Russia, European..... | | | | | | | 23,691 |
| Scotland..... | 142 | 16,467 | 5,566 | 274 | 1,972 | 2 | 30,881 |
| South Africa..... | | | | | | | 25,100 |
| Sweden..... | | | | 12,752 | 110 | | 18,218 |
| Others..... | 6,260 | 6344 | 4 | 2,753 | 1,003 | 891 | 39,175 |
| Total..... | 588,358 | 162,365 | 83,815 | 254,968 | 94,274 | 36,042 | 4,581,282 |

¹ Spain, 4,375; American goods returned, 876; Uruguay, 1,645; Luxemburg, 110; Peru, 4; Belgium, 1.

² Austria, 3,967; Belgium, 324.

³ Rumania, 1,553; American goods returned, 893; Austria, 275; Luxemburg, 314.

⁴ Austria, 135.

⁵ China, 4,551; Austria, 774.

⁶ Australia, 19.

⁷ Lithuania, 1,102; Austria, 206.

⁸ Austria, 333; Estonia, 331.

⁹ China, 652.

Comparative field tests carried on for many years have shown marked differences in adaptability to conditions in the United States of seed grown in different parts of the world. As the difference in agronomic value between domestic and foreign grown alfalfa and red-clover seed became recognized, domestic seed commanded a higher price, often 50 per cent above that of imported seed.

Coloring to Prevent Substitution

In order to prevent the substitution of imported seed for domestic seed, the Federal seed act was amended to require the coloring of all imported seed of alfalfa and red clover. This coloring enables the consumer to know whether he is buying imported or domestic seed. The proportion of the seed colored and the color used indicates the general agronomic value of the seed for use in the United States. Ten per cent red coloring (orange red in the case of Argentine alfalfa seed) indicates general unadaptability, all other alfalfa and red-clover seed being colored 1 per cent green with the exception of Canadian seed, which is colored 1 per cent violet. The 10 per cent coloring provision, affecting seed of alfalfa and red clover grown in certain countries of mild climate, has brought about a reduction of imports from those countries quite independently of natural supply and demand.

Supplies of all of those seeds subject to the Federal seed act have been drawn during the last 10 years from practically all of the producing countries of Europe as well as from Russian Turkestan, Japan, South Africa, and South America.

The principal sources of alfalfa have at various times been Argentina, Canada, Italy, France, and Russian Turkestan. During 1926 and 1927 Canada was the principal source of supply, and in 1929 Argentina and Russian Turkestan. The chief source of red-clover seed has been France, with smaller proportions from Italy, England, Germany, Poland, Russia, Chile, Canada, and Czechoslovakia, the imports from Poland and Russia having increased markedly the last two years. Canada has been the chief source of alsike clover and has furnished all of the Canada bluegrass seed imported into the United States. Crimson-clover seed has come mostly from France, with Germany, Hungary, England, and Czechoslovakia furnishing smaller quantities. Germany, Poland, England, and Czechoslovakia have been the largest exporters to the United States of white-clover seed. Orchard grass has come from Denmark and Germany; rape from Holland, Japan, France, and Germany. Perennial ryegrass seed has come from Ireland, New Zealand, Scotland, and England, and Italian ryegrass seed from Ireland, Denmark, New Zealand, France, and Scotland. Approximately one-half of the hairy-vetch seed was shipped from Germany, although doubtless some of this was grown in other countries. Next to Germany, Latvia, Czechoslovakia, Hungary, and Sweden were the largest shippers of this seed to the United States. Spring vetch came mostly from Germany, Holland, Latvia, and England. Foxtail millet was the largest other item, 1,637,200 pounds being imported, mostly from Canada.

Seeds Not Subject to the Act

Of the forage-plant seeds not subject to the Federal seed act, two items are imported in sufficient quantities to be of particular impor-

tance. During the last eight years approximately 30,000,000 pounds of sweetclover seed were imported, mostly from Canada, and 12,500,000 pounds of fescue seed, mostly from New Zealand and Germany. In the case of those seeds not subject to the Federal seed act, there is no restriction as to the quality that may be imported.

E. BROWN,
Principal Botanist, Bureau of Plant Industry.

FOREIGN Trade in Farm Products Is Above Pre-War Level

The world trade in agricultural products continues on a high level. As the population of the world continues to increase, the large commercial and industrial centers continue to grow and increase the demand for agricultural products from distant areas where conditions are favorable for agricultural production. The division of labor or specialization in agricultural production among the different nations continues to increase. In spite of the many attempts on the part of several European countries following the World War to increase their self-sufficiency, they have not succeeded except in a few special instances and are importing more than ever before. Commercial and industrial centers are developing in the Orient, particularly in Japan and China, and thereby increasing the international trade in agricultural products.

Both the agricultural exports and imports of the United States are being maintained on a considerably higher level than before the war. The tendency in the United States is to increase exports of a few commodities, such as apples, raisins, citrus fruits, and tobacco, and to maintain on a high level the exports of wheat and cotton, whereas the exports of some of the grains and meats are declining. On the other hand, agricultural imports into the United States are increasing. There is a tendency to increase imports of winter vegetables, vegetable oil-bearing seeds, sugar, cocoa, silk, and especially rubber.

Europe an Expanding Market for United States Fruit

The rapid increase in exports of fruit is an outstanding feature of United States trade. An examination of our export statistics shows that the value of fruit exported from the United States during 1928-29 exceeded that of tobacco; was not much less than the total value of bacon, hams, and lard; and amounted to about 45 per cent of the grain and 16 per cent of the value of cotton. All kinds of fruit shared in the advance, with fresh fruit showing the heaviest gains. With increased purchasing power and higher standards of living, Europe is the most promising outlet for fresh, dried, and canned fruit. The United Kingdom consumes at least half of the fresh apples, one-third of the raisins, and about three-fourths of the canned fruit that are exported from the United States. Germany is our best outlet for dried apples, apricots, and prunes; over 80 per cent of our orange exports and a fourth of our raisins go to Canada.

Exports of Meats and Meat Products Decline

With hog production in Europe practically restored to a pre-war basis and production in Argentina and Canada on the increase, United States exports of bacon and hams have resumed the decline

which set in at the opening of the century and which was only temporarily interrupted by the abnormal demands of the World War. Lard is an outstanding exception to the downward trend in exports noted in the case of other meats and meat products. Because of the lack of competition from other sources the United States has been able to maintain its position as an exporter of lard. The competition of vegetable oils and fats from the tropical and subtropical countries, however, is increasing.

The Orient Takes More Cotton, Tobacco, and Wheat

Better control of the boll weevil, expansion in acreage, and improved harvesting methods, have resulted in more and cheaper cotton so that United States exports have regained their pre-war position and are considerably above the exports of the early post-war years. The striking development of the textile industry in Japan and to some extent in China and the growth of cotton manufactures in Canada have strengthened the demand from these sources and, supplemented by an increasing home consumption, have lessened our dependence on European markets. Before the war at least 95 per cent of our surplus cotton went to the United Kingdom and continental countries; to-day only about 80 per cent is consigned to those markets whereas Japan, which in earlier years purchased less than 3 per cent of our total exports, now takes about 14 per cent. Annual exports to that country since 1925 have averaged 1,286,000 bales.

About 45 per cent of all the tobacco that finds its way into the channels of foreign trade comes from the United States with recent years showing a decided upward trend. The increase in the volume of United States exports, consisting largely of bright flue-cured tobacco, has been absorbed almost entirely by countries outside of Europe, more especially by China. With a growing taste for the cigarette it seems that China may continue to import cigarette tobacco heavily from this country.

The Orient is also becoming an important factor in the wheat trade of the world. Japan is not only increasing wheat flour consumption but does an important milling business for other parts of the Orient. China is importing increasing quantities of wheat and flour. In the past season these two countries took large quantities of cheap low-grade wheat from Canada in addition to considerable quantities of wheat and flour from the United States and Australia.

Russia Still Negligible in Agricultural Export Trade

Russia, once the world's largest exporter of cereals, is still virtually absent from the export market and there is little indication of an early recovery of its former position. Along with the breakdown of Russia's economic structure, the development of the newer agricultural areas in other countries has gone forward at a rapid pace and European deficit countries which formerly drew largely from Russian supplies are now importing heavily from Canada, Argentina, and Australia. Canada now exports more than three times as much wheat as it did before the World War and twice as much as Russia then exported. The strength of our foreign competitors in the European market since the war has had an unfavorable effect on our exports of

wheat which, though continuing much above the pre-war level, have declined in recent years, but this decline has been offset in part by an increase in exports of barley which in 1928-29 reached the record figure of 48,000,000 bushels.

Russia's exports of butter are still far below the pre-war level and its former position has passed to New Zealand which now ranks next to Denmark as the largest exporter of this commodity. The United Kingdom now imports nearly four times as much butter from New Zealand as it did before the war and almost twice as much as it formerly imported from Russia.

The United States Imports of Agricultural Products

Principal imported agricultural products competing directly with United States products are sugar, wool, flaxseed, and subtropical fruits and nuts. Only about 20 per cent of our total consumption of sugar is produced in continental United States. About 20 per cent comes in duty free from Porto Rico, Hawaii, and the Philippine Islands, and practically all of the remaining 60 per cent is imported from Cuba. The proportion of our total sugar consumption supplied by Cuba and our insular possessions is increasing. Imports of wool constitute about 50 per cent of our total consumption. A considerable part of the imports, however, consists of carpet wool, which does not compete directly with our domestic wool. In recent years there has been a definite tendency toward increased wool production in the United States and a corresponding downward trend in importation of wool.

Imported flaxseed, largely from Argentina, provides over 40 per cent of our domestic consumption of this product. Flaxseed imports are on a considerably higher level than before the war, while domestic production is on the average only slightly larger. Imports of such subtropical products as lemons, dried figs, raisins, and walnuts are in general declining as a result of increasing production in the United States. They still represent, however, a considerable part of our total consumption of these products. An outstanding development in our import trade in agricultural products has been the increased importation in recent years of vegetable oils and oil materials. Although these products, such as copra, coconut oil, and palm oil, are not produced in the United States, they compete in use with American dairy products, cottonseed oil, and other domestically produced vegetable oils.

About half the agricultural products imported do not compete directly with the products of the farms of the United States. The most important of these products are rubber, coffee, tea, and silk. Most of the silk comes from the Orient, and imports have doubled in the past 10 years. Coffee and cocoa imports have been maintained, whereas the imports of tea have declined in this period. The greatest increase in trade has taken place in rubber. The great development of the automobile industry in the United States has brought a large proportion of the rubber trade to the United States and imports have more than doubled in the past 10 years.

O. C. STINE,
*Principal Agricultural Economist,
Bureau of Agricultural Economics.*

FOREST-FIRE Fighters Use Big Machines in Cutting Control Roads

The fire demon, which takes a toll of more than a million dollars a year from California's fields and forests, now faces a defensive army equipped with new and powerful fire-prevention and suppression weapons. These weapons are 60-horse power tractors, 5-ton blade graders, and heavy V-type drags used in the construction of fire lines and motor ways (rough and narrow fire-control roads) in the 18 national forests of the State.

The Forest Service, from years of experience in the ways of conflagrations, has long known that an important factor in the prevention as well as the control of large fires is a network of motor ways and fire lines. These permit fire fighters to reach the fire in the shortest possible time and place it under control before it has a chance to become a big fire. The saving in fire-fighting expenditures alone, not to mention the saving of valuable forest resources, is often equal to the cost of the motor ways or fire lines. General adoption of this system of fire protection by Federal foresters has been prevented in the past by the high cost of man power for building fire lines and motor ways by hand

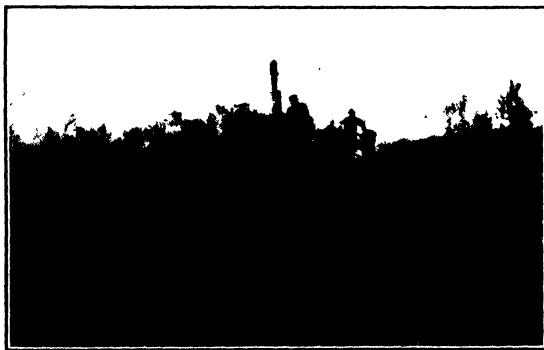


FIGURE 79.—Fire-line construction with machinery

through the dense brush that clothes many foothill and mountain areas. A veritable army of men were formerly required to do this gruelling construction work, and the cost of manual labor frequently exceeded \$500 a mile. In some mountain regions, with extremely rough terrain and a dense brush-forest growth, 175 sweating, toiling men were able to build only 1 mile of

cleared fire line a day. When dependence was placed upon muscle, and mattock, brush hook, and shovel in the face of an on-rushing fire, the work was often disastrously slow.

The adoption of machinery in the place of hand labor bids fair to revolutionize fire-line construction. Powerful tractors, pulling heavy V-drag or graders, plunge with brute force through the dense brush, leaving in their wake a broad, open fire line, often constructed at the rate of a mile an hour. Experiments conducted by the Forest Service in the national forests of California during the past two years have resulted in the construction of 160 miles of motor ways on the Shasta, California, Tahoe, Stanislaus, Sierra, Santa Barbara, and Cleveland National Forests, and 110 miles of fire lines in the Angeles and Cleveland National Forests. The average cost of the motor ways was \$125 per mile, and of fire lines from 30 to 50 feet wide \$50 per mile, as against a former cost by hand labor for fire-line construction in the same regions of approximately \$400 per mile. The Forest Service had 32 tractors and graders operating in 1929 in the national forests of California, and is planning to extend the construction of fire lines and motor ways by machinery as rapidly as funds are made available.

WALLACE HUTCHINSON,
Assistant District Forester, Forest Service.

FOREST-GROWN Evergreens Can be Transplanted if Proper Care Is Taken Who has not dug up a young pine, fir, or spruce in the woods, planted it in his yard, cared for it and watched over it hope-

fully, only to see it slowly fade and finally wither? A tree can not live if, for any great length of time, more water is lost through the leaves and stems than is absorbed by the roots. In a normally developed tree the roots have a greater spread than the branches. When a tree is dug up the roots are usually cut off at a convenient distance from the main stem, and thus the water absorbing capacity is reduced 50 to 90 per cent. In broad-leaved trees this handicap can be offset in part by transplanting before the leaves appear in the spring, and in part by cutting back the branches. Evergreens, on the other hand, must be transplanted when in full foliage, and it is not considered good practice to prune the branches. The roots of evergreens are also more sensitive to drying than are those of deciduous trees.

The chief endeavor in transplanting evergreens should be to reduce to the lowest possible point the unfavorable balance between water loss and water absorption.

The first rule is to transplant when the tree is in a more or less dormant state. Early spring is usually the best time, although some nurserymen prefer fall or late summer. The best season in a given locality depends upon the climate and must be determined by local experience.

The second rule is to get as much root as possible. Since there are obvious limitations to the length and depth of roots that can be removed, it is always safest to select rather small trees. A tree 3 or 4 feet tall and fairly well supplied with roots is going to be larger at the end of five years than a taller tree which is too severely handicapped by loss of roots.

Keeping the Roots in Good Condition

The third rule is to keep the roots in the best possible condition, so that they can begin functioning immediately in their new environment. Do not expose them to dry air for more than a few seconds. Wet burlap and moss provide an effective cover. Unnecessary bruising or barking of roots should be avoided.

Even with the greatest precautions the roots receive a setback when torn loose from the soil particles. For this reason the best practice is to remove the tree with a ball of earth attached to the roots, digging carefully around and under the tree, then covering the ball with burlap and binding securely with a network of strong cords. A tree 4 feet tall should have a ball at least 2 feet wide and from 1 to 2 feet deep. Larger trees require larger balls. Theoretically it is possible to transplant a tree of any size if the ball of earth is sufficiently large. But the person who wants only a few trees at nominal cost will obtain best results by selecting specimens not over 4 feet tall.

Many trees properly dug are killed by careless handling in transportation and storage prior to planting. If the roots are not balled, they should be packed in moist moss or other moisture-retaining material. If they are balled, the ball should be watered if necessary and protected against sun and wind until safe in the ground. The tops should also be covered in order to reduce transpiration to a minimum.

Moisture Requirements After Transplanting

After the tree is planted the soil should be kept moist but not too wet. A good practice is to set the tree so that the upper surface of the ball is half an inch below the general ground level, and when watering apply enough to wet the entire ball. It may be advisable to provide shade the first season. Spruce and firs thrive in partial shade and may be planted permanently on the north side of a building or fence.

One who contemplates removing trees or other plants from a national forest should first consult the supervisor or ranger. In removing trees from any land have a thought for the beauty and well-being of the forest. As a rule trees should not be dug along public highways. In no case should the holes be left open or neighboring trees damaged. It is usually possible to select trees for removal in spots where neighboring trees will quickly occupy the space left vacant. Thus neither the productiveness nor the appearance of the forest need be impaired.

G. A. PEARSON,

Director, Southwestern Forest Experiment Station, Forest Service.

FOREST-LAND Exchange Policy Is to Protect Timber and Watersheds

The Rocky Mountain national forest district embraces the national forests in South Dakota, Nebraska, Oklahoma, and Colorado, and all but two of those in Wyoming. These forests, like all those in the Western States, were carved out of the public domain. They were created primarily for the production of timber and the protection of watersheds. The boundaries were laid out, however, with due consideration for the then prevailing conditions of use and settlement in the immediate vicinity. The forests were largely restricted to wild, rugged mountainous areas, and the boundary lines kept far above the lower limits of timber growth. Very large areas of land ideally suited for timber production were never included. In recent years, the Forest Service has been under constant pressure to make additions from these lands. Actual addition to the forests can be accomplished only by presidential proclamation or by act of Congress. The latter is the only possible procedure in certain States, including Colorado and Wyoming.

In conducting the work of land exchange, the Forest Service establishes, first, the ultimate, or theoretically ideal boundary for each national forest. This boundary is drawn so as to include, as far as is practicable, only those lands which will yield their greatest return when handled permanently under systematic management for growing timber and protecting watersheds. Grazing and agricultural lands are not included, except incidentally where it is impracticable to exclude them without making an illogical boundary.

Examination of lands within these ultimate boundaries has been going on for many years. Some areas have already been included on the forests. Areas aggregating 1,671,846 acres have been examined, and approximately 750,000 acres are in the process of examination. Whether all or any part of these lands become national-forest lands will depend entirely upon the ability of the interested local people to secure the needed legislation or presidential action.

Of late years there has been a growing demand from stockmen for the addition of public-domain grazing lands to the forests. The reason, of course, is the desire to secure protected and stabilized grazing privileges. The inclusion of grazing lands as such involves a wholly different basis of valuation and would necessitate a specific broadening of the primary purposes for which the forests were created. This, if it is ever done, can only be in response to a widespread demand from the people expressed in the form of definitely permissive legislation.

Much Land of No Farm Value Taken Up

At the time the forests were created, much of the accessible arable lands within the boundaries had already passed to patent under the various homestead laws. The forest homestead act of June 11, 1906, resulted in the patenting of an additional acreage of presumably agricultural land. In addition, many areas have been patented under the mining laws. During the last 20 years, however, actual experience has shown that a great deal of the land taken up for farming has no agricultural value. Much of this land has been logged over and used for grazing, but is deteriorating and is no longer yielding sufficient returns to pay taxes. The same is true of great numbers of worked-out mining claims whose incidental timber and forage resources have also been skimmed off.

A very large proportion of these lands have decided values for either timber production or watershed protection, or both, and are capable of yielding satisfactory returns if consolidated with adjoining national-forest lands and placed under management. Under the authority of the general exchange act, the Forest Service is engaged in acquiring such lands as rapidly as practicable. The law permits the exchange of Government-owned land or Government-owned timber for the private lands, but stipulates that each exchange made must clearly be to the public interest.

A carefully prepared exchange plan is now in effect on each forest. All the privately owned lands on the forest are mapped and recorded, with data describing each individual tract. Two general groups are established, one of lands not desirable of acquisition, such as agricultural lands, active mining properties, and recreational areas owned by resorts, hotels, etc., and one of lands desirable for forestry purposes.

Whenever land is offered for exchange forest officers appraise the land carefully, determine its true worth to the Government, and complete the transaction only if the consideration demanded by the owner falls within the limit established by the appraiser. In all cases, the actual prices realized in the open market for comparable lands are carefully considered. Under no circumstances is this market value exceeded, and, in fact, the majority of exchanges are consummated on the basis of materially lower prices.

In the land for land trades, the Government land disposed of is usually in isolated tracts or is land possessing grazing rather than timber values. As a general rule, good timber land is not traded away, the only exceptions being when the Government acquires better land or an increased acreage of similar land. The Government has traded away 28,384 acres of national-forest land and has secured 31,848 acres of land and 21,184,000 board feet of standing timber in return. Additional cases pending involve the acquisition of 13,441 acres and 9,387,000 board feet of timber for 11,868 acres of Government land.

Land Obtained at No Cost

Under the land for timber form of trade, the Government has acquired 33,218 acres of private land with 57,257,000 board feet of timber in return for 42,859,000 board feet of Government timber. This Government-owned timber was valued at \$114,945.96. The cost to the Government of the land acquired was \$3.16 per acre but the 57,000,000 feet of timber acquired is considered to be worth more than the 43,000,000 feet traded away; so actually the land was secured at no cost. Additional cases are pending which will give the Government 8,065 acres of land and 42,732,000 board feet of timber in exchange for 13,868,000 feet of timber valued at \$41,062.03. In spite of these apparently bargain prices no injustice is being done individual owners. Often the owner is carrying a heavy burden in taxes and being unable to market his timber to advantage considers such a trade good business.

The policy of the Forest Service is not to acquire standing timber except incidentally, but to devote most of its energies to acquiring cutover and burned lands which can be secured very cheaply and which, under proper management, can be restored to productivity and become a valuable addition to the public forests.

JOHN W. SPENCER,
Administrative Assistant, Forest Service.

FOREST Planting an Economic Need in Northern Lakes Area Forest planting is now becoming generally recognized as one of the outstanding economic necessities for the rehabilitation of the northern Lake States region. This vast forest region lies roughly in the upper or northern halves of the States of Michigan, Wisconsin, and Minnesota.

There are approximately 57,000,000 acres of absolute forest land in the Lake States. Only about 14 per cent of this area carries appreciable stands of merchantable timber. The total lumber production from the three States in 1927, the last year for which statistics are available, was 1,794,000,000 board feet and the lumber consumption was 3,526,000,000 board feet, a net deficit of 1,732,000,000 board feet shipped in from without the region. In other words, one of the potentially greatest forest-producing regions of the United States is now consuming annually practically double its lumber cut.

What Planting Can Do

It is estimated that 33,000,000 acres in the region are denuded or bear no forest growth of appreciable value. If planted to young trees this area, now a burden to the owners and largely reverted or in process of reversion to the counties and States for nonpayment of taxes, would produce, at the average rate of growth for plantations, stands of 200 board feet per acre per year, an annual total of 6,600,000,000 board feet. What an economic relief this would be to the States and counties involved.

Planting in the Lake States is far beyond the experimental stage. Technic is well developed. Under competent technical supervision thrifty growing plantations are certain. Up to and including 1928,

successful plantations had been established on about 100,000 acres. Of this about 56,000 acres were planted by the States, 32,000 acres by the Federal Government, and possibly 12,000 acres by private owners. The State of Michigan has been particularly active and alone has planted approximately 49,000 acres. For all agencies the area planted yearly in the Lake States has now risen to over 25,000 acres. Even at this greatly increased rate, however, 1,320 years would be required to complete the present area in need of reforestation.

Planting Costs and Returns

Forest planting in the Lake States is relatively cheap. The sandy pine lands which constitute a large percentage of the denuded acreage can be satisfactorily stocked for as low as \$3 per acre. Considering all types of lands, however, an average figure of \$5 per acre on efficient large-scale projects is more conservative. The Lake States Forest Experiment Station estimates representative yields at merchantable size and age for plantations on medium sites as shown in Table 13.

TABLE 13.—*Yields of jack, Norway, and white pines and of white spruce on medium sites*

| Species | Age (years) ¹ | Yield |
|-------------------|--------------------------|----------------------------|
| Jack pine..... | 40 | 30 cords pulp-wood. |
| White spruce..... | 60 | 30 cords pulp-wood. |
| Norway pine..... | 60 | 15,000 feet board measure. |
| White pine..... | 60 | 15,000 feet board measure. |

The financial return, of course, depends upon a number of variable factors and must be determined separately for each plantation project, but under conditions obtaining over large portions of the region a net money return of 4 to 6 per cent on the capital investment is indicated. This does not take into account the more important returns to the communities and States or renewed raw materials and rehabilitated industries.

Public sentiment is becoming insistent upon an adequate program for the large public holdings of deforested lands. This sentiment is particularly well crystalized in Michigan where, after long years of sporadic effort, an annual program in excess of 8,000 acres on State forest lands is now under way. It is evidenced by the action of the Kiwanis clubs of the State which, in 1928 and 1929, have contributed a total of approximately \$20,000 to finance the establishment of a 10,000-acre plantation of Norway pine on the Huron National Forest, the Government contributing the trees and the technical supervision of the work. Meanwhile, pulp and paper, water power, and other private agencies are translating increased interest into larger acreages planted. Wisconsin and Michigan distribute annually millions of tree seedlings from State-owned nurseries at slightly more than cost of production for planting within their borders.

Federal Share of the Planting Burden

Under the present program the Government owns or has in process of acquisition in the Lake States, national-forest lands which include

1,214,000 acres in need of planting. This is 3.8 per cent of the regional total. The present program provides for planting on these lands about 10,000 acres a year, at which rate the job would be completed in 121 years. In order to fulfill the avowed purpose of these Lake States national-forest units as model forestry demonstration areas, the planting work should be speeded up to completion within a 30-year period, or a yearly program of 40,000 acres. The ultimate effect of such a program lies not merely in bringing into production about a quarter of a billion board feet of wood products annually from the Government property now idle, but in stimulating State, county, municipal, and private reforestation on the remaining thirty odd million acres of idle forest lands in this vast region which is now suffering acutely from the shortage of wood material and the dwindling of the wood-using industries.

W. F. RAMSDELL,
Assistant District Forester, Forest Service.

FORESTATION Averts Erosion on Abandoned Mountain Farm Land

When steep cultivated land is abandoned before its surface has been bound by vegetation, the soil that has accumulated through centuries of rock disintegration may be entirely removed by a few years' erosion. (Fig. 80.) Even when erosion is moderate the removal of the fertile surface



FIGURE 80.—Destructive erosion resulting from inadequate vegetation protection of the surface soil, in the southern Appalachian Mountains

soil seriously reduces the productive capacity of the land. The greatest damage occurs when hillside fields have been abandoned directly following clean cultivation, for the soil has no protecting cover of grass or other densely rooted vegetation. On some lands gullying has proceeded so far as to render the land practically worthless. (Fig. 81.)

In western North Carolina 25 years ago, for example, tobacco lands were cleared during the winter, cropped for three or four successive years, and then entirely abandoned for newly cleared fields. The first year after abandonment these fields were seriously injured by erosion. To-day the fields abandoned when this system was practiced still present a serious problem of reforestation.

Although gullying may not be in evidence each heavy rain carries away a part of the unprotected loose surface soil so that the cumulative

damage during the year may be tremendous. When this washing of loose soil occurs it frequently happens that there is no conspicuous evidence of damage until the soil is completely washed away to the bed rock.

Where deep gullies have already developed they must be stopped by mechanical barriers. Stones and brush have been employed for stopping small gullies. Under some circumstances the seeding of orchard grass, Japanese clover, or other suitable vegetation on the gully slopes has been successful. It is a common practice in some sections to cut the young trees that may have become established on an eroded area and to throw these into the gullies in an attempt to prevent further washing. This does not appear to be the best policy, for living trees themselves are very efficient in protecting the soil.

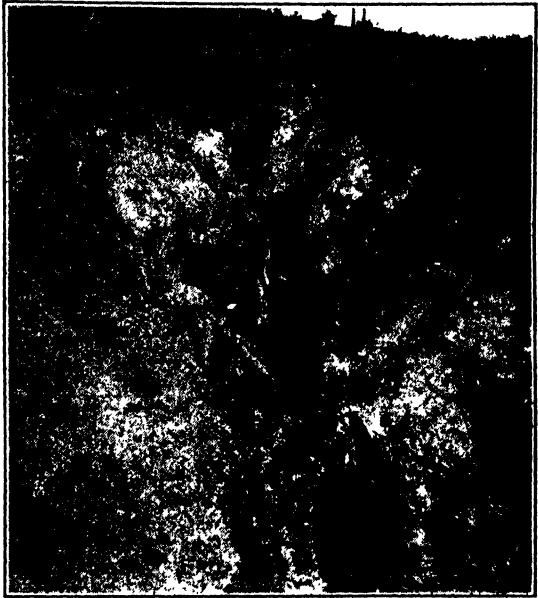


FIGURE 81.—The result of careless treatment of abandoned farm land in the Appalachians. Deep gullies have rendered the land practically worthless

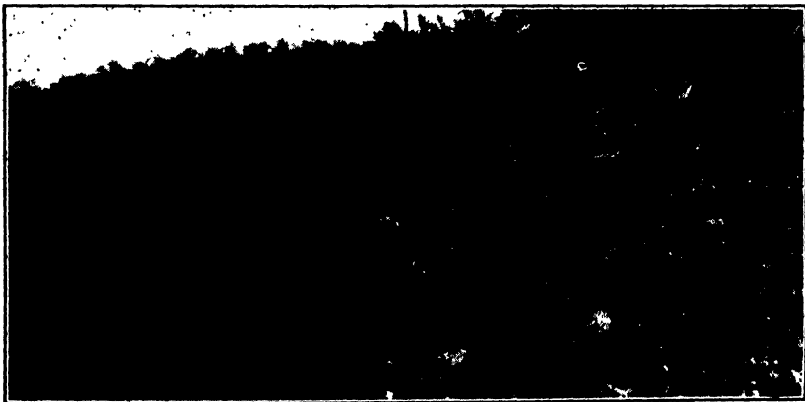


FIGURE 82.—A wise precaution in abandoning farm land in the mountains—orchard-grass rotation following a corn crop in the southern Appalachians. This area will soon restock to a crop of timber

Northern White Pine Plantings

The restoration of worn-out and abandoned agricultural land to forests has been successfully demonstrated. Plantations of northern white pine on worn-out land in western North Carolina have produced

excellent returns. Where abandoned fields are adjacent to timbered areas with seed trees, natural restocking will take place. To promote this, excessive surface erosion before the seedlings have become established must be prevented. This can be done by seeding the fields to grass following cultivation, in case no other cover is present. The area must also be completely protected against fire. Some erosion will of course take place while the land is gradually being claimed by young trees, particularly when the restocking is very light and other vegetation cover is inadequate. Even gullying may occur. Under such circumstances, and also when the abandoned areas are extensive or seed trees unavailable, planting must be resorted to if a satisfactory stand of timber is to be expected.

With some effort on the part of the owner cleared mountain land no longer required for agriculture may be converted into permanent pasture or temporary pasture that may later become restocked to a timber crop, which, in addition to insuring the owner a reasonable rent return will protect the soil from erosion and actually increase its fertility through the addition of organic material in the form of leaf litter and detritus.

C. R. HURSH,

Associate Forest Ecologist, Forest Service.

FORESTRY Cause Is Helped by Northwest Chambers of Commerce

Though members of chambers of commerce or other business organizations may live within a region containing almost half the remaining virgin timber of the United States it does not necessarily follow that they are interested in forestry. With heavy forests all around them, in what is still a new country, it would be only natural for them not to worry unduly about the future forest. Until a few years ago this was the situation in the States of Oregon and Washington. However, with Washington leading and Oregon second in annual lumber cut, and with the cut-over areas in the two States running over 300,000 acres annually, this attitude is giving way to an active interest in future sources of raw material for the region's dominant industry—lumbering.

There are now forestry committees in 21 chambers of commerce in these two States. The first of these committees was started by the chamber of commerce of Seattle, the dean of the State forest school of Washington, and a local forest supervisor six years ago. Some of the things for which the committee worked are a study of forest taxation, improvement of State forest fire laws, forestry education in the public schools, reduction of smokers' fires, abatement of the summer smoke nuisance, leaving roadside strips of timber, setting aside of State forests, and the formation of a State forest policy.

Later, the Klamath County Chamber of Commerce, in southern Oregon, put on annually a stop-forest-fires campaign which was successful in awakening local business men not only to the need of fire prevention but to the problem of growing future forest crops.

Accomplishment In Oregon

An outstanding example of effective accomplishment is the work of the forestry committee of the chamber of commerce of Portland, Oreg.,

in securing the passage of a forest-taxation law in 1929. This committee, headed by a banker, succeeded not only in interesting in forest taxation the majority of the bankers of the State, but in bringing about the organization of a forestry committee in the State bankers' association. With the lumber industry the dominant one of the region, every banker needed to be informed on forest-taxation matters and to know something of the problems of growing wood crops.

This Portland committee is taking a keen and active interest in forest research, State forests, forest protection, more topographic maps for the State (to be secured through cooperation of Federal, State, county, and municipal agencies), public land laws, roadside timber strips, arboretums, and many other phases of forestry. Forestry committees in the smaller towns are interesting themselves in State and Federal legislation as well as in more local matters such as roadside planting, the smoke nuisance from brush fires as it affects the summer-tourist business, smokers' fires, future timber supplies for local sawmills, and local demonstration forests.

JOHN D. GUTHRIE,
Assistant District Forester, Forest Service.

FRUITS and Vegetables in Growing Demand Among All Consumers

The contents of the consumers' market basket present a vastly more varied assortment of fresh foodstuffs than in the so-called "good old days" or even than a few years ago. Common necessities of to-day were in the luxury class and were frequently unobtainable 20 years ago.

This change in the daily diet of the average family is due to a number of influences, the principal ones being the (1) development of large-scale production in new areas which supply fresh fruits and vegetables during seasons when home-grown or locally grown produce is not available; (2) increasing popular appreciation of the value of green stuffs in the diet; (3) continued improvement in grading, packing, and handling on the way to the retailer; (4) more general display of these goods by chain grocery stores; and (5) distribution by motor truck to small towns and even to individual farm and village families. Constant abundance has resulted in prices within the reach of almost every consumer. Instead of depending upon the root cellar, the dealer offers produce fresh from the fields—tender, crisp, and appetizing—every month in the year and usually at moderate prices.

The menu of the average family of to-day can be well balanced throughout the year with head lettuce, fresh peas, spinach, kale, new cabbage, string beans, new carrots, green peppers, eggplant, and other fresh vegetables, citrus fruits, and apples. During the early spring and late fall this list can be supplemented by such fresh produce as was formerly out of season—green corn, new potatoes, grapes, plums, pears, peaches, strawberries, watermelons, cantaloupes, and kindred types of melons—all from distant regions. This menu is in sharp contrast with the former steady winter diet of meats, cereals, and fruits and vegetables that had been stored for long periods, or canned.

Our large consuming and distributing markets now draw their supplies of fresh fruits and vegetables from all parts of the United States

and a number of foreign countries. Favorable climatic and growing conditions, particularly in the States of Arizona, California, Florida, and Texas, have made possible the production of fresh vegetables on a gigantic scale for shipment during the winter and early spring. In some other States, particularly Colorado, conditions are especially favorable for the production of a late fall crop of such commodities as cauliflower, green peas, lettuce, and cantaloupes, which are shipped fresh to all large markets.

Tremendous Increase in Some Vegetables

The increase in production of some of these fresh products has been almost phenomenal. The most striking examples are lettuce, green peas, tomatoes, and carrots. Ten years ago the commercial acreage planted to lettuce totaled in round figures only 16,800 acres, and the total number of car-lot shipments reported to the Bureau of Agricultural Economics was only 7,000 cars. In 1928 we had 127,000 acres, and the shipments amounted to over 51,000 cars, or more than seven times the movement during 1918. Among the vegetables the movement of lettuce in car lots is now exceeded in volume only by potatoes. In addition to these car-lot shipments, millions of city dwellers on both coasts are supplied largely by motor truck direct from the farm to the city market.

The increase in the production of green peas for fresh shipment has also been rapid. In 1918 we had only 6,000 acres, and the car-lot shipments were 691 cars, whereas in 1928 the plantings had grown to 61,000 acres, and the shipments were nearly 5,000 cars. In addition, 1,067 cars were imported, principally from Mexico.

In 1918 we planted 93,500 acres of tomatoes for market, giving a car-lot movement of 15,000 cars. By 1928 we planted 146,000 acres and shipped 30,500 carloads, while some 6,000 cars were imported, principally from Mexico and Cuba. These figures do not include any tomatoes grown for canning.

Carrots have also made a notable record. In 1924 the commercial plantings were 11,000 acres. In 1928 there were 24,000 acres. The first annual record of carrot shipments, which was secured in 1920, showed a total movement of only 1,630 cars. In 1924 we shipped 3,000 cars. Due chiefly to the growth of the bunched-carrot business in California and Texas, shipments by 1928 had reached 8,800 cars.

This demand for fresh fruits and vegetables is significant of the changing food habits of the American people. There is an increasing and insistent tendency toward a more varied diet. This has been stimulated by the constant display of fresh products at popular prices, made possible by applying the principles of mass production to the agriculture of our winter-gardening areas. The contents of the consumers' market basket are changing rapidly. The proportion of fresh vegetables and fruits is still increasing. The American dinner table thus carries a better pledge than ever before of the healthfulness of the oncoming generation.

WELLS A. SHERMAN,
*Principal Marketing Specialist,
Bureau of Agricultural Economics.*

FRUIT and Vegetable Receipts by Truck at New York Recorded The quantity of fruits and vegetables moved to market by motor truck has increased rapidly in recent years and is now a considerable part of the supply in many cities. Its determination is important for market news and statistical purposes.

Beginning in July, 1928, the Bureau of Agricultural Economics inaugurated a system of collecting daily statistics of motor-truck receipts of fruits and vegetables in New York City, our largest market. A member of the bureau's market news office telephones each receiver, of which there are more than 100, at a designated time each forenoon for this report. Fairly complete statistics are thus obtained showing the quantity and State of origin of each fruit and vegetable received daily by motor truck on the city's wholesale and jobbing markets. Most of these shipments arrive on the Washington Street market in down-town New York, where the large receivers who sell chiefly to jobbers are located, but receipts on the several other jobbing markets and at chain-store warehouses are included. Receipts on the farmers' markets are not included.

The records disclose that the quantity which arrived by motor truck was equivalent to 15,108 carloads, or 8 per cent of the domestic supply during the 12 months beginning with July, 1928.

Origin of Motor-Truck Supplies

Ten States supplied these 15,108 carloads. This quantity was about one-fourth of the total receipts from these same States, as shown in Table 14.

TABLE 14.—*Comparison of motor-truck receipts of fruits and vegetables with rail and boat receipts from the same States on New York wholesale and jobbing markets, July, 1928–June, 1929*

| State of origin | Receipts | | State of origin | Receipts | |
|--------------------------------|-----------------|------------------|---------------------|-----------------|------------------|
| | By motor truck | By rail and boat | | By motor truck | By rail and boat |
| | <i>Carloads</i> | <i>Carloads</i> | | <i>Carloads</i> | <i>Carloads</i> |
| New Jersey..... | 7, 131 | 5, 017 | North Carolina..... | 156 | 5, 528 |
| New York (Long Island)..... | 2, 588 | 4, 331 | Connecticut..... | 38 | 22 |
| New York (other sections)..... | 2, 058 | 13, 797 | Massachusetts..... | 7 | 579 |
| Maryland..... | 1, 115 | 2, 381 | Rhode Island..... | 3 | 6 |
| Pennsylvania..... | 1, 068 | 1, 065 | | | |
| Delaware..... | 665 | 459 | Total..... | 15, 108 | 45, 620 |
| Virginia..... | 279 | 12, 435 | | | |

New Jersey was the principal source of motor-truck supplies. It furnished 47 per cent of the quantity which arrived by truck. New York State was second with 31 per cent. More than half of the New York State arrivals originated in Long Island. The most distant State from which motor-truck receipts were reported was North Carolina, more than 500 miles away, which supplied about 1 per cent of the total.

The motor-truck arrivals from New Jersey, equivalent to 7,131 carloads, were equal to 59 per cent of the combined rail and motor-truck receipts from this State. A similar comparison for Long Island indicates that the motor truck carried 37 per cent. For an area within a

radius of 100 to 150 miles of New York City it is probable that at least one-half of the shipments to the city's wholesale and jobbing markets are carried by motor truck.

Fruits and Vegetables Carried by Motor Truck

Fifty-six different fruits and vegetables were reported in the motor-truck receipts. Ten of these comprised 61 per cent of the total of 15,108 carloads. These 10 with the percentages of the total motor-truck supply represented by each were: Apples, 9.3; strawberries, 7.7; tomatoes, 6.7; cauliflower, 6.5; mushrooms, 6.3; green beans, 6.1; sweetpotatoes, 5.1; peppers, 5.0; green corn, 4.7; and lettuce, 3.5.

The arrivals of these 10 commodities by motor truck constituted 38 per cent of the total wholesale and jobbing market supply of the same commodities from the same group of States. From this area 50 per cent of the strawberry shipments to New York were by motor truck. Corresponding percentages for certain other crops were cauliflower



FIGURE 83.—Motor-truck receipts of fruits and vegetables in Wallabout Farmer's Market, New York City

92 per cent; mushrooms, 95 per cent; green corn, 91 per cent; tomatoes, 44 per cent; and apples, 20 per cent. Motor-truck transportation was particularly important with respect to the highly perishable and more expensive fruits and vegetables.

The month of greatest motor-truck movement was August, when the equivalent of 2,904 carloads arrived. The minimum movement was in February, when the equivalent of only 270 carloads arrived.

In addition to receipts on the wholesale and jobbing markets of the metropolis, immense quantities are received by motor truck on the three important farmers' markets in the city. Most of these supplies originate within 50 miles of the city. Complete statistics for the farmers' markets are not available, but reports for April, May, and June, 1929, on two of the three farmers' markets, indicate receipts (practically all by motor truck) equivalent to 3,115 carloads. This is almost equal to the motor-truck arrivals on the wholesale and jobbing markets for this period, which were equivalent to 3,735 carloads. It therefore appears probable that the tonnage brought in by motor truck

to the three farmers' markets exceeds the motor-truck receipts on the city's wholesale and jobbing markets.

The costs of motor-truck transportation of fruits and vegetables vary greatly with such factors as the commodity, the distance from market, and competition among truck owners. In many instances they are approximately the same as costs of transportation by freight including necessary drayage in the market. The principal disadvantage of the motor truck as a carrier of fruits and vegetables as stated by city dealers and shippers is the greater uncertainty of market supply, resulting in greater price fluctuations than when a definite number of cars of a commodity are known to be on hand for the day's market. Some of the advantages are: Less handling both in the producing district and in the market because of elimination of loading and unloading of cars, and quicker transportation from many sections, which often means that fruits and vegetables arrive on the market in better condition.

J. W. PARK,
*Associate Marketing Specialist,
Bureau of Agricultural Economics.*

FUTURES Market at Times May Enable Farmers to Hedge Speculative Risks Can the individual farmer ever use the futures market to advantage in the marketing of his crops? He can at times and under certain conditions. There is danger, however, of being intrigued by its speculative possibilities and of failing to consider it solely from the standpoint of protective utility.

The facing of risks is so much a part of the everyday life of the average farmer that he is inclined to take chances and carry risks affecting his crops as a matter of course. With respect to growing crops he must face continually the risks incident to weather and insects as well as the risks of unfavorable prices. Whether his crops will be marketed at a profit or at a loss is oftentimes a matter of conjecture.

There are forms of insurance available to cover certain of the farmer's risks, but the risk of unfavorable price returns is one against which he does not have any sure means of protection at all times. This risk commences even before the planting of the crop and continues until the crop is sold or otherwise disposed of.

There is perhaps no way in which the grain producer can avoid carrying throughout most of the growing season the risks arising from price fluctuations. Through proper use of the futures market, however, he may be able at times to take advantage of a profitable price situation when it presents itself although the actual crop be not at the moment in a salable position.

"Pegging" an Attractive Price

Speculative activity, or some unusual development, may advance prices to an attractive figure at a time when a farmer's crop is assured but before it is ready to be moved immediately to market. In that event, provided there is a proper relationship between cash grain prices and futures prices, it may be possible by selling futures to "peg" this attractive price for later use. This would be in the nature of a hedge

and would be accomplished by selling that future which is most likely to bear a uniform relationship to the cash grain to be marketed. By cash grain is meant the actual grain which the farmer has to sell.

Assume that a farmer is reasonably certain of having 3,000 bushels of corn which will grade No. 3 in December and which he is willing to sell at, say, 80 cents per bushel, basis Chicago. Should the Chicago December future reach a point that suggests 80 cents per bushel for No. 3 corn in Chicago he will sell 3,000 bushels of the December future. Having done so, and having protected his sale by ample "margin," he may feel reasonably sure of realizing 80 cents per bushel for his cash corn, even though the market declines and is below that price at the time he can deliver the actual corn.

To illustrate: On October 1, a farmer sells 3,000 bushels of the December future at, say, 83 cents, it being thought that No. 3 corn in December will be selling at no greater discount under the December future than 3 cents per bushel. (No. 3 corn under present rules is deliverable on Chicago futures contracts at $2\frac{1}{2}$ cents discount.) By December 15, when the cash corn is ready for delivery and sale to the local elevator, prices may have declined 10 cents per bushel. Instead of receiving a price which with freight and handling charges added would be equal to 80 cents per bushel, basis Chicago, a price is received equal to only 70 cents per bushel. Having sold the December future, however, at 83 cents, it may now be bought back at 73 cents, or at a profit of 10 cents per bushel. This profit added to the 70 cents per bushel received for the cash corn will give the original price objective of 80 cents per bushel.

Situation in Rising Market

If prices, instead of declining, advance 10 cents per bushel the situation will be reversed. The farmer then will realize 10 cents per bushel more for his cash corn but will lose this amount in having to buy back the future at 93 cents, so that in either event the effect will be to fix the realized price at 80 cents per bushel.

The foregoing is offered merely as an illustration of how the futures market may be used at times to shift a price risk. A hedge does not always work out in the manner indicated. Whether it does or not depends upon the relationship between cash prices and futures prices being maintained. This in turn is affected by grade differences and other factors, all of which must be taken into account and studied carefully. However, the hedging possibilities of the futures market are worthy of serious consideration. Occasionally they offer opportunity to secure higher prices than are obtainable when the actual grain is ready for market.

Hedging operations may not be engaged in safely without a careful survey of all of the possible factors involved, such as ability to deliver the cash grain and to meet all possible margin requirements. By margin requirements is meant the deposit of funds which commission firms require to protect these contracts in the case of adverse market changes.

Additions to margin funds must be made sometimes on very short notice. Sometimes spreads between cash grain prices and the futures prices will develop to modify or destroy the protective effect of a hedge even after it is properly placed. The hedger must be constantly alert to these possibilities if he would be successful.

Other Types of Hedges

In this discussion reference has been made to just one type of hedging transaction. There are others. For example, the livestock farmer who is interested in buying grain as cheaply as possible may sometime see futures prices reach a point that reflects a favorable basis for meeting his feeding requirements. The cash grain may not then be immediately available or it may be that he is not then prepared to receive and care for any large quantity. Under such conditions he may go into the futures market and buy futures with the idea later of buying cash grain and selling the futures. Except for the purchases and sales being made in reverse order the latter kind of hedge is like the one first discussed; both go to the purpose of taking advantage of a favorable price opportunity when one appears.

In neither of the examples suggested does the farmer expect to make any money through speculating on prices. On the contrary, he merely selects a price point in the futures market which reflects a satisfactory price for cash grain and, by hedging, converts a presently available price into one which is available at a later date instead.

In all hedging transactions care must be taken not to become involved in dealings that are purely speculative in character. There is a vast difference between seeking protection against an existing price risk and in seeking other and additional risks in the hope of speculative gain.

J. M. MEHL,

Assistant Chief, Grain Futures Administration.

GASES' Response to High Pressure and Temperature Shown

The nature and properties of gases have challenged the interest of the philosophic and scientific world ever since the time of the ancient Greeks.

To Van Helmont (1577-1644) must go the honor of giving the present name to this form of matter. To Lavoisier (1743-1794), a remarkable experimentalist, must be given the credit for discovering the real chemical nature of gases. The experimental work of Boyle (1627-1691), Charles (1746-1823), and Gay Lussac (1778-1850) on the behavior of gases under changing conditions of temperature and pressure has led to a statement of what is known as the "ideal" gas law $PV=RT$, in which P is pressure, V is volume of a given gas mass, T is temperature on the absolute temperature scale, and R is a constant.

This same expression has since been derived inductively by Clausius and independently by Krönig (1857) by making certain assumptions regarding the nature of a gas. For instance, the gas molecules are assumed to be separate particles with perfectly elastic properties. They have mass but occupy no space and there is no attraction between particles. The particles are in rapid motion and their total energy content may be expressed as kinetic energy ($\frac{1}{2}n mc^2$), where n is the number of particles, m the mass of each particle, and c the average velocity of the particles. A gas that conformed to all these conditions would be an ideal gas and would conform rigidly to the above formula.

From this expression, it is evident that the pressure volume product is independent of pressure or volume, and that its change with temperature is linear. Employing the same criteria it is easy to show that such properties as the viscosity, the specific heat, and the heat conductivity of a gas must also be independent of pressure. This law, however, has all too frequently been used in the calculation of the specific properties of "real" gases in engineering design and in studies of equilibria in gas reactions. Real gases do not conform to this law even under moderate changes of pressure, volume, or temperature, except at certain purely coincidental points known as

"Boyle points." In general real gases approach more nearly the ideal at high temperatures and low pressures, but the relationships are complicated and not yet fully understood.

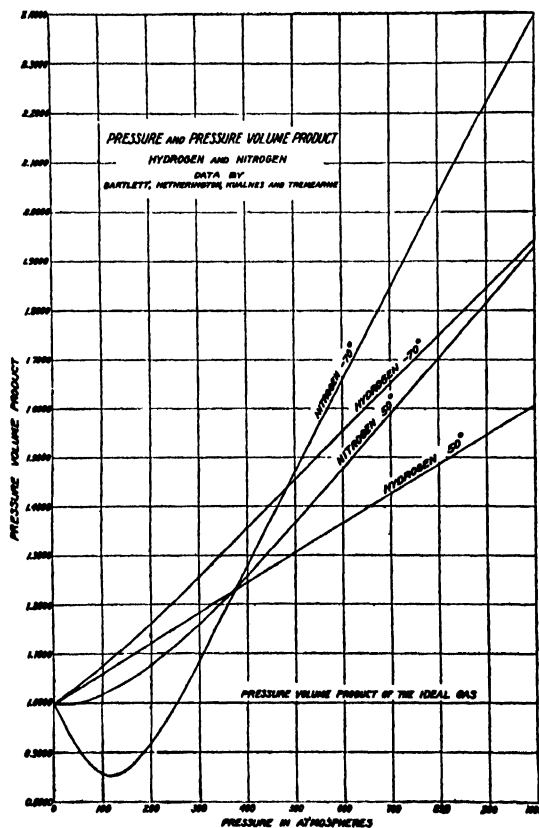


FIGURE 84.—The effect of pressure on the pressure volume product of nitrogen and hydrogen

Attraction Among the Molecules

It is certain that molecules do occupy space and that the free volume is thereby reduced. In the light of modern concepts of the structure of the atom with its minute electrons and protons, it is probable that this space is little more than a sphere of influence. It is almost as certain that there is attraction between the molecules, an attraction that amounts essentially to an increase in pressure and in its aggregate effect is largest when the molecules are closely packed. Therefore, both V and

P in the formula must be modified with changing conditions, and their product can not remain constant. Likewise, modern physics pictures a molecule that not only increases its speed and hence its kinetic energy, as heat is applied, but which spins on its axis, and if there are two or more atoms to the molecule they vibrate much as though they were connected by a band of rubber. There are also electronic changes resulting from collisions and perhaps other energy-consuming processes which obviously will affect the specific heat, the heat conductivity, and viscosity, since the magnitudes of these effects vary with changing conditions of temperature and pressure.

In order to show clearly the extent to which the physical properties of real and ideal gas differ, a series of diagrams are presented in which are shown the effects of pressure on the properties of certain

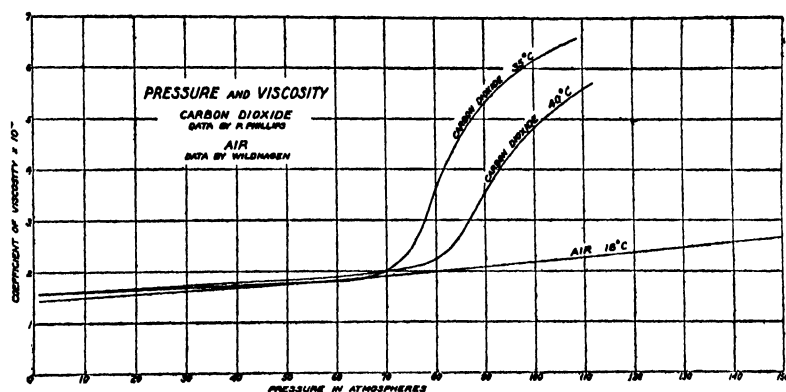


FIGURE 85.—The effect of pressure on the viscosity of carbon dioxide and air

common gases. Figure 84 presents the PV products of nitrogen and hydrogen at two temperatures and at pressures to 1,000 atmospheres, it being assumed in each case that the initial volume is 1 liter at one atmosphere at the temperature of the experiment. The dip in the nitrogen curve at the lower pressure and temperature is characteristic of all gases at low temperatures and becomes more pronounced as the critical temperatures are approached. It is apparent that at 1,000 atmospheres pressure and 0° , nitrogen, for instance, occupies more than twice as much space as the same quantity of an ideal gas, while at 100 atmospheres its volume is less than that of an ideal gas. In a similar manner Figure 85 shows the effect of pressure on the viscosities of carbon dioxide and air. The carbon dioxide is at a temperature not far removed from its critical temperature (31.1°C). While still a gas, its density at the higher pressures is similar to that of a liquid. (At 35° and 100 atmospheres pressure the density is 0.7 that of water.) Its viscosity at these pressures may, therefore, be partly due to the same

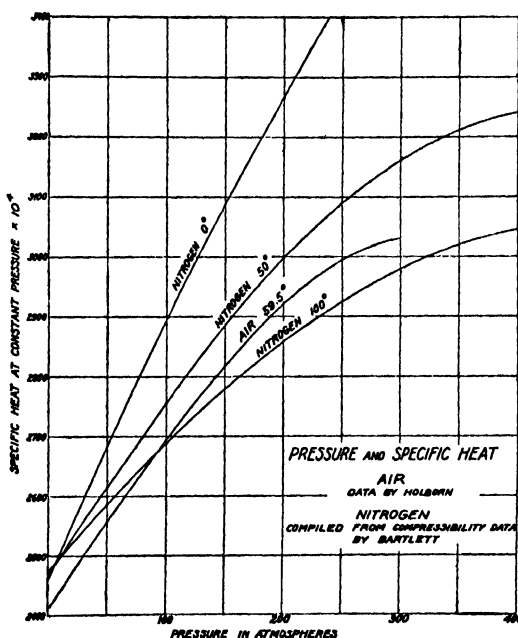


FIGURE 86.—The effect of pressure on the specific heat of nitrogen and air

cause, i. e., friction between molecules, which appears to be the principal factor in causing viscosity in liquids. However, even the viscosity of the air, far removed from its critical temperature, increases more than 100 per cent over a 120 atmosphere change in pressure.

Effects of Pressure on Molecular Motion

Figure 86 pictures the effect of pressure on the specific heats of air and nitrogen. High pressure tends to restrict intra- and intermolecular motion and possibly causes some association of the molecules. If heat is added and the compressed gas allowed to expand at constant pressure, extra energy is required to bring the gas to its new condition in which these phenomena are less pronounced.

While a large number of data are available dealing with the pressure-volume temperature relationships of a number of real gases, relatively little or nothing is known of other properties of gases under extreme conditions of temperature and pressure. These properties can not be predicted with certainty. The problems of their accurate experimental determination are complex and will continue for many years to require for their solution and correlation the skill and patience of master minds.

EDWARD P. BARTLETT,

Senior Chemist, Bureau of Chemistry and Soils.

GIN Efficiency an Important Factor in Cotton Quality What are the gins doing to our cotton, is a question foremost in the minds of those interested in the cotton industry. If the many protests from this country and abroad may be taken as a criterion, the ginning preparation of American cotton is not as good as it used to be. Moreover, unofficial estimates by members of the industry indicate that improper ginning causes an annual financial loss in the market value of the American cotton crop that runs into millions of dollars. Such estimates, moreover, are based on the art of cotton classing; much injury and damage, expressed in terms of the fiber qualities on the seed, escapes this method of valuation.

Evidently ginning is an important factor influencing the quality of the American cotton crop and, as such, may be considered a vital step in the production of raw cotton, affecting not only southern agriculture but all consumers of American cotton.

The grade, staple, and character of the ginned lint may be appreciably influenced by the ginning and cleaning processes, but chief attention has been directed to the effect of ginning upon that element of quality known as grade. This seems to have been due to the more visible and tangible nature of the grade factors—foreign matter, color, and so-called preparation, the latter of which includes roughness, nepiness and the extent to which it is gin cut. The effect of ginning upon staple length, for instance, has been considered only in those cases in which the lint has been so severely broken and roughened as to warrant a penalty. Recently, however, information has been obtained relative to the effects of ginning upon the elusive and little understood factor of character, as expressed through the uniformity of fiber lengths, strength, etc.

Method Used In Ginning Studies

The department in 1928 began a series of ginning studies involving both experimental ginning and cleaning and a partial survey of commercial gins. In these studies the fibers removed by hand from seed cotton⁷ and the fibers in the ginned lint from the same lot of seed cotton are arrayed according to length. (Fig. 87.) The weights of the different lengths are determined on microchemical balances, under controlled conditions of temperature and humidity, and the results obtained permit the construction of curves for uniformity of fiber lengths. The curves for the hand-pulled sample represent the most nearly perfect ginning and they approximate, as near as it is now possible to determine, the true distribution of fiber lengths as they occur on the seed in nature. The difference between the two curves reveals the nature and extent of changes in the proportion of fibers of various lengths which resulted from ginning.

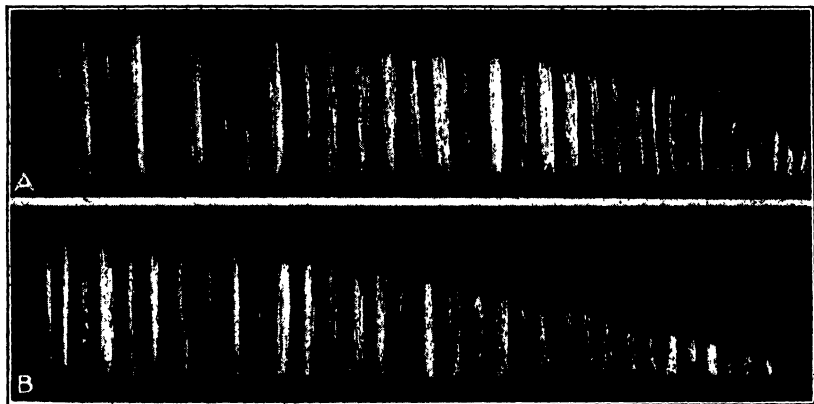


FIGURE 87.—Arrays of cotton fibers, showing the variation in length of fibers from the same lot of seed cotton. Note the high degree of uniformity in the hand-pulled sample (A) and the low degree of uniformity in the corresponding saw-ginned sample (B). The difference indicates changes resulting from saw-ginning which properly might be described as inefficient

A marked example of the effect of ginning upon the length of fibers is illustrated in Figure 87, as shown by the high degree of uniformity of fiber lengths in the hand-pulled sample and the low degree of uniformity in the saw-ginned sample. Results obtained from larger samples show that only about 61 per cent of the fibers in the ginned lint are 1 inch and above as compared with 86 per cent in the hand-pulled sample. This difference of 25 per cent appears to be rather large even for such long cotton. Further, the percentages of the longer lengths are smaller and the percentages of the shorter lengths are greater in the saw-ginned sample as compared with the corresponding lengths in the hand-pulled sample. As a result of the two different methods of ginning the spinning utility of the two samples of lint from the same lot of seed cotton would differ markedly.

These laboratory results indicate the nature and extent of changes in fiber lengths which may result from ginning, some of which is also detectable by the art of cotton classing. However, these changes ordinarily would not be detected in an examination of only the ginned lint.

⁷ The fibers from the seed cotton are carefully removed by hand after being "butterflied" on the seed.

Ginning Efficiency Varies Widely

It is generally known that gins are variously operated throughout the Cotton Belt and the results from preliminary studies indicate wide variations in efficiency. Effort is being exerted to determine for cottons of different grade, staple, character, and moisture content the relative importance of the many different factors operating during the cleaning and ginning processes such as speeds, settings, seed-roll density, pitch and condition of teeth, etc. The effects of such factors are being defined not only in terms of uniformity of fiber lengths, but of neps and strength. Finally, the fibers, cleaned and ginned under experimental conditions, are being spun into yarn in order to facilitate proper interpretations in terms of spinning behavior and yarn properties.

Work of this type is fundamental as it is essential to the development of scientific technic for ginning and for the study of ginning. Such information, moreover, should suggest opportunities for improvements in gin machinery, organization, and operation and serve as a basis to educational work in the interest of better custom ginning.

ROBERT W. WEBB,

Cotton Technologist, Bureau of Agricultural Economics.

GOVERNMENT Printing Office Finds Yearbook Its Biggest Single Job

This Yearbook, the thirty-sixth that has been issued by the Department of Agriculture, is the largest single piece of printing produced in the largest printing plant in the world, namely, the Government Printing Office, in Washington. More than 400,000 copies of the Yearbook are



FIGURE 88 —Government Printing Office composing room in 1861

issued for distribution, mainly by Members of Congress. In fact, the publication is issued as a House document, though the subject matter is, of course, furnished by the Department of Agriculture. Twenty thousand copies are ordered by the department. The rest of the edition is placed at the disposal of Congress.

In printing 400,000 Yearbooks the Government Printing Office uses more than 1,300,000 pounds of paper. It uses also 55,000 yards

of vellum-cloth cover, 170,000 pounds of binder's board, 7,020,000 yards of thread, 1,400 yards of crash, and 5,600 pounds of glue. The completed books if stacked one upon the other, would reach a height of approximately 11 miles. These details may give a better idea of what is involved in the publication of the Yearbook than would be given by a mere statement of the cost of the work.

Though, as already noted, the Yearbook is the largest single piece of printing done annually in the Government Printing Office, it represents only a small fraction of the total printing done in this great establishment. The Public Printer purchases more than 50,000,000 pounds of paper a year, a quantity that if made up into octavo books would form a pile over 500 miles high.

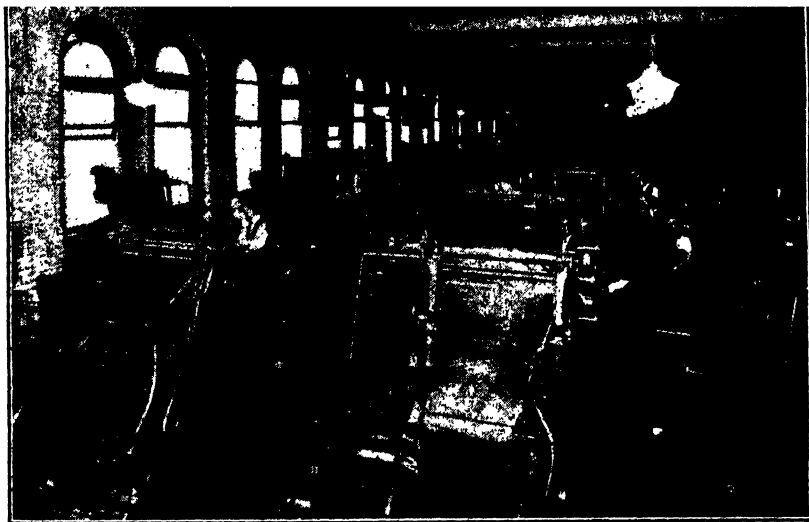


FIGURE 89.—Part of the linotype section in the present Government Printing Office. The Congressional Record is set in this section

In 1861, when the Government Printing Office began operation as a Government unit, it was comfortably housed in a small 4-story plant that cost \$135,000. It then had 350 employees and an annual pay roll of \$170,000. To-day the buildings of the Government Printing Office have 17 acres of floor space. A unit now being built will add 4 acres. When this unit is completed, the buildings, equipment, and materials in the establishment will have an estimated value of \$9,250,000. Its employees now number more than 4,000 and their annual pay exceeds \$8,500,000.

The mechanical equipment of the Government Printing Office includes the largest battery of typesetting machines in the world. There are 172 linotypes, 90 monotype keyboards, and 129 casting machines. It takes over 15 tons of metal to carry the daily product of these machines. The office has 160 printing presses, ranging from the small platen type to the big machines that print the Congressional Record. One of the big jobs done in the Government Printing Office is the printing of Government postal cards to the number of 6,000,000 a day, or more than 1,800,000,000 a year. Its presses turn out money-order blanks, census forms, and income-tax forms by the hundreds of millions.

Enormous Volume of Printing Handled

Through mass production and efficient management the Government Printing Office handles its enormous volume of printing with accuracy and speed. Costs have been reduced by the use of up-to-date machinery, by standardization of processes, and by improved production methods, so that to-day this office stands as an indispensable adjunct to the Government of the United States. For the production of about 150 daily, weekly, and monthly publications the Government Printing Office maintains special schedules governing the delivery of proofs and of completed work. Similar schedules regulate the handling of overnight work for Congress, such as the Congressional Record, bills, reports, hearings, etc. The demands by the departments for rush work are also very great. Recently, for example, eight distinct jobs of printing were requisitioned by the Department of Agriculture in one day, on each of which a 12-hour delivery was requested; then an urgent demand was made for 60,000 pamphlets on the Mediterranean fruit fly which were required immediately in the campaign against this newly introduced pest. The order was filled, though other department work had to be retarded.

All told, the public documents division of the Government Printing Office distributes approximately 50,000,000 copies of publications yearly. In addition, more than 9,000,000 copies are disposed of by sale. Bulletins and periodicals issued by the Department of Agriculture account for nearly 25,000,000 copies of the total distribution.

FRANK D. SMITH,
Assistant Chief of Publications, Office of Information.

GULLIES May be Filled and Reclaimed by Aid of Small Brush Dams. Gullies form quickly on even slightly rolling lands subject to continuous clean cultivation, particularly where the soils are of fine texture and of rather low humus content. They not only reduce the area of the field available for cultivation, but also interfere with farming operations, thereby increasing the cost of production for the whole farm and at the same time decreasing the total yield. Once formed, they enlarge rapidly, and in some sections gullying and sheet erosion together are causing the abandonment of many farms. (Fig. 90.)

The use of brush dams is an effective and inexpensive method of reclaiming gullies where the supply of brush is plentiful. The method is especially applicable for controlling erosion in gullies draining small areas, which do not carry a large flow of water. Brush dams are easily constructed, requiring no particular skill or expert labor. Care must be observed, however, in order that the dams may be effective and permanent, especially where flows of considerable volume occur occasionally.

Loose brush dams may be used where there is but a very small flow of water, as in a gully that extends directly up a field slope and has no tributary gullies. Anchored dams are necessary where there is a considerable flow. In all cases the dams must be tight enough to check the flow materially and must be strong enough to withstand the pressure of the water that collects above them. They must be built with care to prevent failure (1) from washing of the bed or sides of the gully by water flowing under or through the dam, (2) from widening of the

gully by water flowing around the ends of the dam, or (3) from undermining at the lower toe of the dam, by the water that flows over the top. They should also be so placed and of sufficient number that water will not overflow the sides of the gully and cut another gully down the slope.

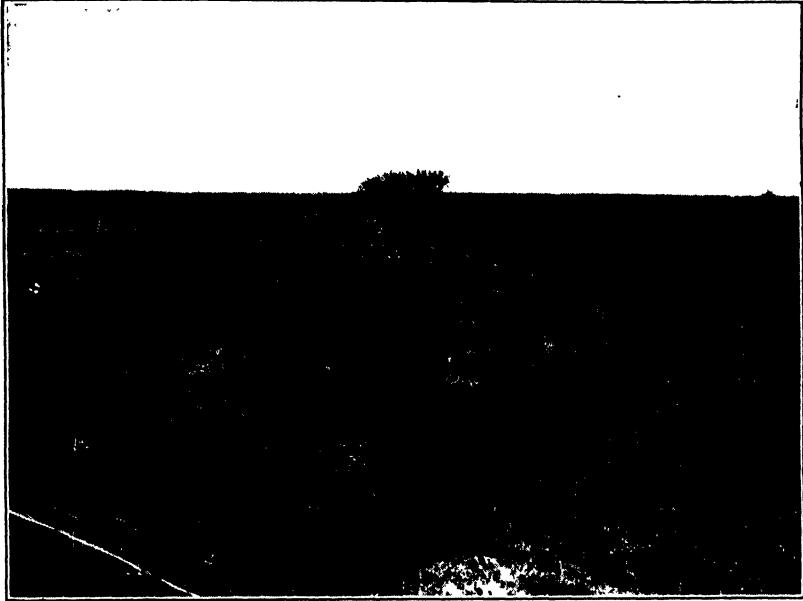


FIGURE 90.—A gully typical of the kind that, growing in size and in numbers, has caused the abandonment of many fields. (Taken near Guthrie, Okla., 1929.)

Height of Brush Dams

The best height for brush dams is usually about 2 feet. Some of the anchored type have been built 4 feet high, but the pressure of the water behind high dams often forces the silt through them and sometimes causes washing of the bottom and sides of the gullies. In some cases, where the fall along the gully is slight, a height of 1 foot has been considered most satisfactory. The distance between dams depends upon their height and the slope of the gully bottom. The top of the upper side of one dam should be level with the bottom of the dam next above, or a little higher; this will cause filling of the gully between the dams. (Fig. 91.)

Construction of a loose brush dam is very simple. The length along the gully to be covered by each dam will depend largely upon the amount of brush available; the greater this length, the less the danger of the dam being washed out. It is good practice first to cover the bottom and sides of the gully with a layer of straw, grass, or similar material, to protect the soil from the direct erosive action of the water. The finer brush should be placed on this protective layer, and the coarser brush on top. The brush should be placed methodically. Merely dumping a few piles into a gully is of no effect in reclaiming the land, except where the flow of water is very small and the open spaces in the pile happen to be small.

Butt Ends Should Point Upstream

It is preferable to lay the butt ends of brush upstream in order that the structure shall be compact and strong enough to withstand the pressure of the water that is held behind it. This arrangement makes the upper side of the dam at the butts of the brush higher than the lower side at the tops of the brush. Then the water flowing over the dam will not drop directly upon the bottom of the gully and undermine the dam, but will flow down a slope of considerable length and therefore will be much less likely to cause damage. The dam should be higher at the sides of the gully than at the middle, in order that the overflow shall not erode the sides of the gully and thus enlarge the gully and wash out the dam. Where loose rock is available, added security will be obtained by placing it on top of the dam to compact



FIGURE 91.—Silt caught above brush dams in gully shown in Figure 90, mostly during one storm of $2\frac{1}{2}$ inches rainfall. (Photograph taken 38 days after Figure 90)

the brush and give greater resistance to pressure of the water collecting above. Silt will collect more rapidly behind a compact dam through which the water flows but slowly than through a loose pile of brush, therefore the tighter structure will cause a more rapid filling of the gully.

Anchored brush dams are built in a manner similar to that described for loose brush dams, with the means of anchoring them added. Such a dam usually extends 10 to 15 feet along the gully. One method of anchoring a brush dam is to drive several rows of stakes across the gully, making the rows 2 feet apart and the stakes 1 foot apart in the row. The gully is partly filled with brush before the stakes are set in place and driven in slightly. Sufficient brush to complete the dam is then placed and heavy wire is stretched along the rows of stakes and fastened to them. Then the stakes are driven down until the wire holds the brush firmly in place, the dam being made lower in the middle than at the sides of the gully.

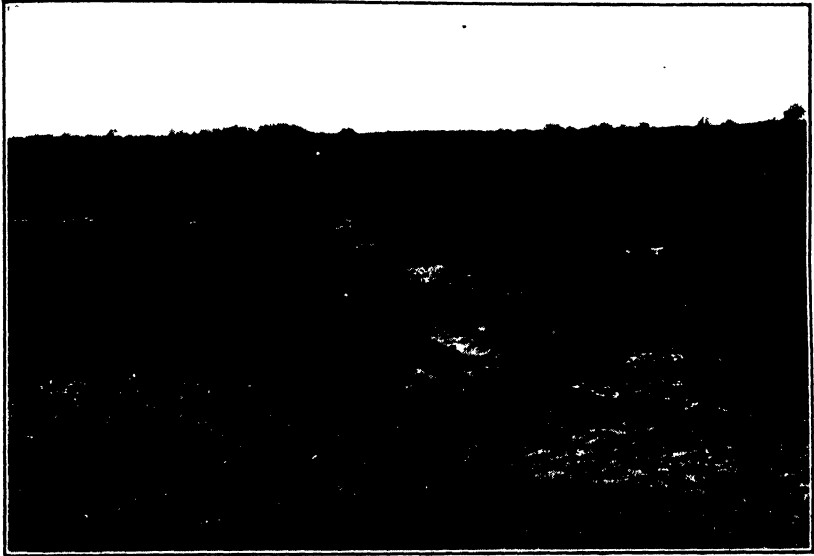


FIGURE 92.—Pole-anchored brush dams in a gully. Completed dams in foreground; beyond them another dam is being constructed

Anchoring Dams With Poles

Where rock is found in the bottom of the gully stakes can not be driven, but the brush dams may be anchored by using poles. The poles are set diagonally into the lower part of the bank, about 3 or 4 feet apart on each side of the gully, and bent over to the top of the opposite bank. (Fig. 92.) The larger ends are set into the ground, at

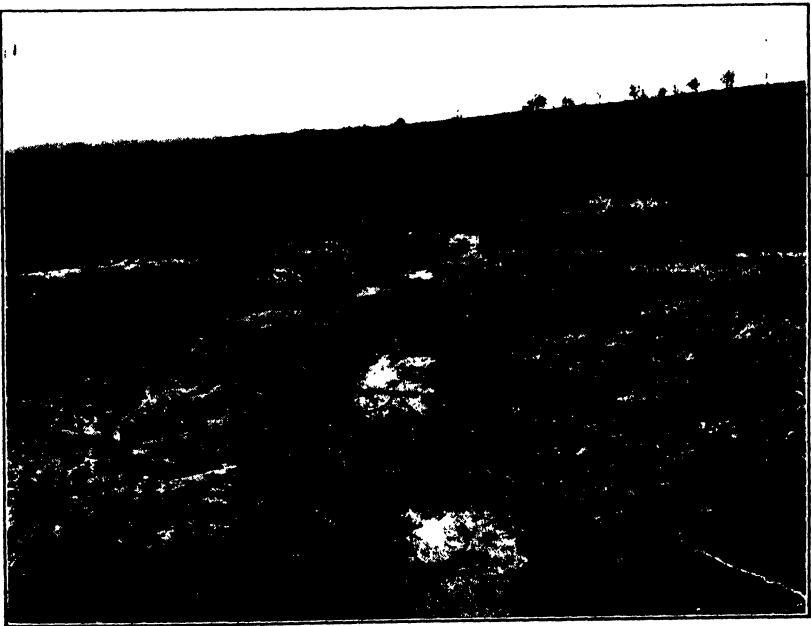


FIGURE 93.—Silt caught above brush dams during a storm of $1\frac{1}{4}$ inches rainfall

such an angle that the poles from opposite sides cross about 2 to 3 feet above the bottom of the gully. The brush is laid between the lower parts of the poles and under the upper parts, so that when the tops of the poles are bent down the brush will be held compactly and securely and be lowest in the middle of the gully. The tops of the poles are fastened to stakes driven for that purpose.

The effectiveness of brush dams in causing the filling of gullies is indicated by results obtained on the soil-erosion experiment farm near Guthrie, Okla., where the department has constructed 45 such dams in 1929. Figures 91 and 93 show filling in two gullies on that farm soon after the dams were constructed. Two months after the view in Figure 91 was taken, the gully could have been plowed in and cultivated.

C. E. RAMSER,

Senior Drainage Engineer, Bureau of Public Roads.

HAIRY Vetch Turned Under Greatly Increases South's Cotton and Corn Yields An increase in the yield of corn from 13 to 40 bushels per acre was sufficiently unique to arouse the interest of many southern farmers last year. The secret of the successful corn grower lay in his use of hairy vetch. When he produced 13.5 bushels per acre on one



FIGURE 94.—Vetch supplies all the nitrogen corn needs. Nitrate of soda at the rate of 200 pounds per acre was applied to four rows of this "vetch corn." Can you tell the difference? These 41 farmers could not

plot of his farm in Conecuh County, Ala., upon which he had applied 200 pounds of superphosphate, no one commented. Even when he gathered 24 bushels per acre from another plot where 200 pounds of phosphate and 85 pounds of nitrate of soda were applied, no particular notice was taken. However, a yield of 40 bushels of corn per acre, which he obtained from land where a crop of hairy vetch had been turned under, could not be overlooked. The results obtained by this farmer and by other farmers carrying on similar demonstrations were brought to the notice of Alabama farmers generally through the efforts of extension workers in cooperation with local farm bureaus. As a consequence of these demonstrations, the cooperative purchase of vetch seed increased from 1,535 pounds in 1918 to 1,127,096 pounds in 1928.

According to a summarized report of hairy-vetch demonstrations for Alabama, average acre yields of corn were increased 22 bushels per acre and of cotton 356 pounds of seed cotton per acre where the crop followed vetch. Farmers who were skeptical that a 100 per cent increase in yield could be obtained through a cash investment of \$5 an acre and a little extra labor were soon convinced after seeing the demonstrations. Assuming corn to be worth \$1 a bushel, a farmer who invests \$5 in vetch seed in the fall should harvest an extra \$22 worth of corn the next fall. If he follows the vetch with cotton, he should expect an increase of \$21.06 worth of seed cotton at 6 cents per pound. This is a return of more than \$4 in a year's time from each dollar invested in vetch seed.

Yields Sometimes More Than Doubled

The Alabama Agricultural Experiment Station has maintained that the State average yield of 15 bushels of corn per acre can be doubled easily when vetch is successfully grown. All farmers who plant vetch are not successful in reaching this goal year after year, but the group of farmers who followed the directions of the county agricultural agents exceeded this claim by 7 bushels during 1928. The experiment station found that a good crop of vetch when turned under usually added to the land nitrogen equivalent to that of 400 pounds of nitrate of soda in its effect on the succeeding crop of corn or cotton; in addition it furnished humus to the soil equivalent to that found in 5 loads of stable manure.



FIGURE 95.—Average stalks of "vetch corn" and corn not on check plot compared. The farmers are standing between the two plots of corn

Alabama merely serves as an outstanding example of the growing interest in vetch as a controlling factor in economic production. Results equally as startling were apparent in other Southern States. There is little doubt that the increased yield of crops following vetch has had much to do with the growing interest in this crop, but increased production is only a part of the value of vetch as a farm investment. According to the United States Bureau of Chemistry and Soils, erosion takes \$200,000,000 from the pockets of the United States farmers annually. The Mississippi River alone carries 428,000,000 tons of sediment into the Gulf. The greater portion of this enormous loss comes from the soils of the South as they are not frozen during the winter months. The growing of winter cover crops prevents a large portion of this loss of leached plant food and soil particles, protecting the soil at a time when gullying is greatest.

The Arkansas Agricultural Experiment Station made an analysis every two weeks during the winter months of the nitrate content of soil from barren plots and from plots on which cover crops were

grown. On the cover-crop areas only a trace of nitrate could be found at any time due to the fact that the cover crop used the free nitrate made available by plant and animal life in the soil. On the barren plots, however, the quantity of nitrate fluctuated from a trace to 10 pounds per acre which was leached out by the winter rains. From these results it was figured that a total of from 20 to 30 pounds of nitrogen had been lost on the barren plots by leaching. At the same time, cover crops prevented a loss of some of the surface soil particles which are very rich in plant food.

Adds Organic Matter to Soils

In addition to collecting nitrogen from the air and saving plant food that would have been washed away, the cover crop which decayed after being plowed under, added organic matter in which southern

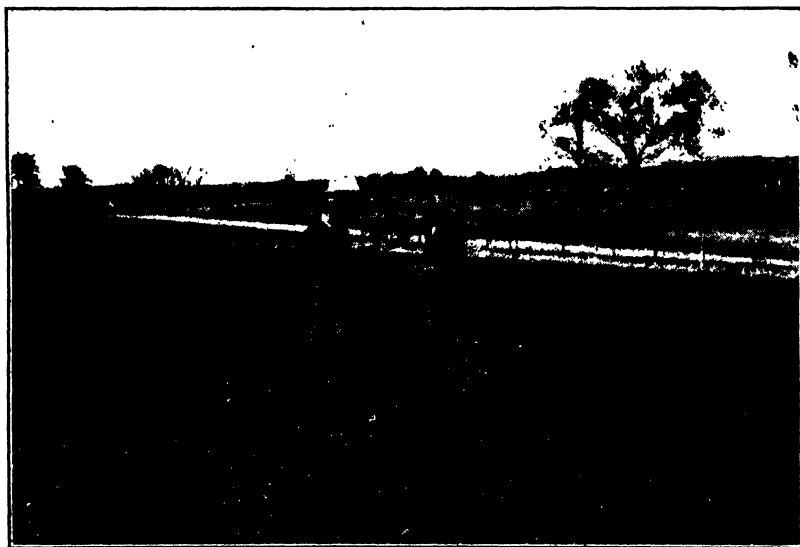


FIGURE 96.—Field of vetch used as cover crop in the piedmont section of North Carolina

soils are usually deficient. Decayed vegetable matter increases the water-holding capacity of the soil insuring against drought damage and facilitating continuous growth and normal fruiting. As all plant food must be dissolved in water and held in solution, a sufficient supply of moisture in the soil insures the greatest profit from applications of commercial fertilizer. It has been shown that 100 pounds of sand will hold 25 pounds of water; 100 pounds of clay, 90 pounds of water; while 100 pounds of decayed vegetable matter will hold 190 pounds of water. The presence of organic matter from vetch turned under also made the usual fertilizer treatment of the crop that followed much more effective.

Decayed vegetable matter also furnished food for millions of little plants and animals that live in each foot of the soil. These plants and animals, like others, must have food, moisture, and air; that is, those which work night and day for our benefit must have air, and this partially explains why plants grow so fast after cultivation and

thrive after a cover crop has been turned under. Another group of these underground plants and animals works in the presence of little air and battles with our friendly soil army which works best in the air. This last army sets free phosphate, potash, and nitrogen used by the crops we grow, while the other, which works without much air, locks these plant foods up, making them unavailable for the use of the plants we grow. Both groups live on vegetable matter we turn under. These half-starved underground plants and animals must have a wonderful time when a crop of vetch or other vegetable matter is turned under, especially on an old "worn-out" cotton field. Of course, the trouble with the old cotton field is that the clean cultivated cotton crop affords little food for our underground friendly army, especially if the cotton stalks are burned year after year.

Vetch Planting Not Costly

Southern farmers have found vetch and Austrian peas fulfill their requirements for a winter cover crop that was "easy to put in," and which could be "turned" in time for a crop the next summer without great cost for seed and liming. Vetch can be planted in cotton or corn middles in the fall at low cost. It will furnish some pasture and can be turned under when "shoe top high." It is easy to turn under at this stage and furnishes enough nitrogen for the corn or cotton crop that follows. Farmers profited by following the vetch "prescriptions" of the extension service and experiment stations of planting early, applying phosphate, and inoculating when sown where vetch had not been grown.

The extension service, in cooperation with the local farm and business organizations, aroused the interest of farmers largely through hundreds of meetings held at demonstrations and through news items and special articles. Vetch-blossom festivals were held and county courthouses and business houses were decorated with the beautiful vetch blossoms. Farmers and business men came long distances with their wagons, buggies, and cars decorated with vetch to enter the parade. They saw "Gen. Hairy Vetch" in action and became interested in his business cards, posters, and platform of general improvement during a State political campaign. Farmers came, they saw, and were convinced of the value of vetch as a farm investment.

C. L. CHAMBERS,
Senior Agriculturist, Extension Service.

HARVESTING Flax With Combine Succeeds in Northern Great Plains Flax for seed is produced chiefly in the hard spring-wheat area of Minnesota, the Dakotas, and Montana. During the last three or four years the combined harvester-thresher has come into use in these States. Although flax generally is more difficult to thresh than wheat, farmers have learned how to handle it successfully with the combine. The condition of the crop, especially as regards weeds, largely determines the method of combine harvesting. Three methods are practiced: (1) Direct combine harvesting of fairly clean flax as soon as fully ripe; (2) allowing the crop to stand until frost has killed the weeds; and (3) the use of the windrow harvester, followed by combine threshing.

Flax reasonably free from weeds can be harvested readily with the combine after the crop is fully ripe and dry. Experienced combine operators are never in any hurry to harvest flax, but wait until the crop is thoroughly ripe. Even when ripe, however, the tough fibrous stems sometimes wind about the moving parts of the machinery. Such parts should be easily accessible so that the stems can be removed without delay. This trouble seldom occurs, however, when the flax is thoroughly dry. Figure 97 shows a combine working under favorable conditions.

Where weeds are abundant harvesting is more difficult. In weedy fields the crop is harvested best by either using the windrower or allowing the flax to stand until after frost kills the weeds. Then they are allowed to dry before harvesting is attempted. Green weeds cause losses in two ways: (1) The seeds, leaves, and stems increase the

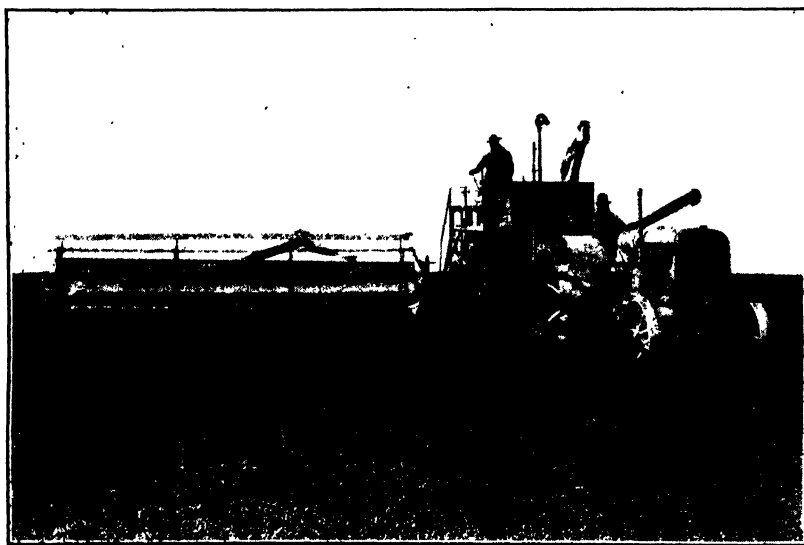


FIGURE 97. -Harvesting fully ripened flax with a modern combine at Brockton, Mont., in September, 1928

moisture content of the threshed flaxseed; and (2) some flax seeds are carried into the straw with the weeds. Green Russian thistles are especially difficult to handle with the combine, as they choke the sickle and also become mixed with the threshed seed.

Windrower for Solving Weed Problem

The use of the windrower in harvesting weedy flax appears to offer the best solution of the weed problem. Special windrow harvesters now are made for use in connection with the combine. Flax can be harvested with the windrower as early as with the reaper or binder, and it dries somewhat more readily in the loose windrow than in the larger reaper bunches or binder bundles. The flax plants tangle and cling together, and the windrowed flax is picked up readily with the "pick-up" attachments now used on combines. Practically no loss from flax left on the ground by pick-up attachments was observed in several fields examined in the last two years.

Perhaps the most common method of handling weedy flax at present is to allow it to stand until after frost has killed the weeds. Fortunately, flax usually can stand in the field for some time after ripening without much loss from shattering. Investigations show less loss from shattering or lodging of flax than of wheat, oats, or barley. This is especially true in the western part of the Dakotas and in Montana, where flax seldom is injured by wilt or rust. These diseases weaken the stems and panicle branches so that the flax does not stand so well after ripening. More loss may be expected, therefore, where these diseases occur.

Flax Allowed to Stand Until After Frosts

In October, 1927, a heavy fall of snow in northeastern Montana caught many flax fields unharvested. Later the snow melted and in December the harvest was completed. One farmer in Daniels County had harvested part of a 400-acre field before the snowstorm and completed the job in December. He estimated a loss of about 1 bushel per acre due to the storm, the earlier harvested flax yielding about 11 bushels per acre and the later harvested about 10 bushels. It is a common practice in Montana and the Dakotas to allow flax to stand until after frost before harvesting. This entails some risk of loss from hailstorms and windstorms, but this risk is less than the average loss resulting from harvesting immature or weedy flax.

Grasshoppers and crickets sometimes do considerable damage to standing flax. Grasshoppers bite off the slender branches, causing the bolls to fall to the ground. Crickets, on the other hand, open the bolls and eat the seeds, both on the standing flax and in the harvested flax in the windrow or shock. Where these insects are present, flax should be harvested and threshed as early as possible.

The dehiscence or partial opening of the flax boll is a good indication of ripeness. In flax varieties commonly grown in the United States the boll naturally is semidehiscent, that is, it opens at the apex and cracks along the margins of its five segments when it is ripe and dry. The boll, moreover, is extremely hygroscopic, that is, absorbs moisture readily, closing tightly when wet by dew or rain, or in humid weather, and opening again as it dries. This characteristic can be used as an indicator of fitness for harvesting. In moisture determinations of ripening flax at Mandan, N. Dak., in 1929, the seeds of *Linota* flax contained from 7 to 10 per cent of moisture when the bolls first became dehiscent. Dehiscence also was observed in all fields where combines were working efficiently.

Moisture Content and Storage

Flaxseed is considered safe for storage when it contains not more than 11 per cent of moisture. In dry harvest weather it usually will contain from 6 to 10 per cent of moisture. A higher moisture content usually is due either to the presence of green weed seeds or to threshing in wet weather. If weed seeds are removed at time of threshing, or immediately afterwards, little difficulty will be experienced in storing flax seed. Recleaners now are available to be used on the combine or for recleaning after threshing. The use of these is to be recommended in threshing weedy flax.

Occasionally a wet fall makes it almost impossible to handle the flax crop without loss in quality and grade due to a high moisture content. In 1926, for instance, much of the crop from Minnesota and the Dakotas, harvested with binders, contained a high percentage of moisture, whereas in 1927 it was comparatively dry. From the 1926 crop nearly 53 per cent of the receipts (3,322 cars) at the Minneapolis market contained between 10 and 12 per cent of moisture, as compared with 8.2 per cent (769 cars) of the 1927 crop. In 1926 only 16.7 per cent (1,050 cars) contained not more than 9 per cent of moisture, whereas 72 per cent (6,777 cars) of the receipts in 1927 contained not more than 9 per cent.

Farmers who raise both wheat and flax are able to make more economical use of the combine because of the longer harvesting season. By the longer seasonal use of the machine the comparatively large investment can be justified. It is estimated that the average cost of harvesting wheat on a large scale with the combine in North Dakota is approximately \$1.50 per acre as compared with about \$3.30 per acre where binder harvesting and separator threshing is practiced. It is probable that about the same relative costs prevail in harvesting the flax crop.

ARTHUR C. DILLMAN,
Associate Agronomist, Bureau of Plant Industry.

HAY Acreage Constant Substitution of mechanical power
Though Work Animals for animal power on farms and the
Have Become Fewer increase of automobiles and auto-
trucks in cities have operated to re-
duce the number of horses and mules in the United States 23 per cent since 1920 although the total acreage of all crops was about the same in 1929 as in 1920. During this period hay acreage has remained about the same although the total number of hay-eating animals expressed as animal units⁸ declined about 17 per cent. Considerably more hay per animal unit is therefore now being fed, and there have been some important changes in the demand for different types of hay. Timothy acreage has decreased about 25 per cent whereas legume hay production has definitely increased. These changes may be ascribed to (1) the decline in the number of livestock using nonlegume hays, particularly horses in cities; (2) a gradual shift that has been going on for the last 20 years toward an increased use of legume hays for all kinds of livestock, especially dairy cows; and (3) the increasing importance of the dairy cow.

The number of horses and mules on farms in the United States January 1, 1920, was 25,323,000; January 1, 1929, 19,506,000. The number of horses and mules in cities decreased from 2,084,000, January 1, 1920, to about 1,450,000 January 1, 1929. The aggregate decrease in total horses and mules of all ages on farms and in cities was from 27,407,000 to about 20,950,000. This is a decrease of 6,457,000 head, or 23 per cent. The number of colts under 2 years of age on farms decreased from 3,312,413 to 1,360,000, or 59 per cent.

During this period the percentage decrease in the number of horses and mules on farms, including colts, was greatest in the States north

⁸ An animal unit is the equivalent of a mature horse in feed requirements.

of the Ohio and Potomac Rivers and east of the Mississippi and along the Pacific coast. In these States the decrease exceeded 28 per cent in all States except Washington, Wisconsin, Indiana, Delaware, and Maine. The decrease exceeded 26 per cent in the Pacific Coast States, and in Idaho, Arizona, the Dakotas, Missouri, South Carolina, and Louisiana; it was less than 13 per cent in North Carolina; and less than 9 per cent in Alabama, Texas, New Mexico, and Wyoming. In the cotton States of Arkansas, Mississippi, Georgia, and Florida the decline since 1920 has been from 17 to 24 per cent. This decrease in the cotton States named is primarily due to the fact that these States are now cultivating less land than formerly. In Tennessee, the decrease since 1920 has amounted to about 22 per cent and in Virginia and West Virginia to about 25 per cent. (Fig. 98.)

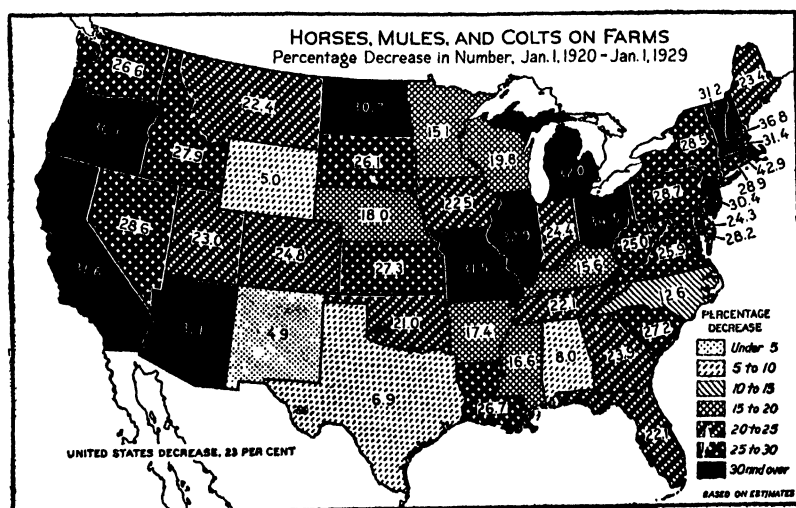


FIGURE 98.—The greatest decrease in the numbers of horses and mules on farms occurred in the eastern and central Corn Belt, in the northeastern hay and dairy belt, and along the Pacific coast

Decrease in the Corn Belt

In most of the States in the eastern Corn Belt and in those to the north and east the percentage decrease in numbers of horses and mules on farms was much greater than in other portions of the United States with the exception of the Pacific coast. This decline in numbers on farms has been a postwar development in most parts of the South and West, but it began much earlier in the North, especially in the Northeast. In New England it has progressed steadily since 1900. In that region the decreasing acreage of crop land was probably the primary cause. In New York and Michigan, the decline began in 1915; in Pennsylvania, New Jersey, and West Virginia it began as early as 1909. In Ohio and Indiana there was an almost steady increase in numbers up to 1913 followed by a gradual decline until 1920 and an accelerated decline since that time.

In general, the reduction in total horses and mules on farms, including colts, since the year of maximum number has been about one-third in the North (excluding Wisconsin, Minnesota, and the Dakotas), about one-fourth in the West, and approximately one-sixth in the

South. Unless there is an accelerated increase in the introduction of improved machinery in the South it is probable that the future decline in horses and mules will not be rapid. In the North and West it seems likely that there may be a further decline in the number of horses and mules.

Assuming that a mature horse or mule consumes, on the average, 2 tons of hay a year, the decrease in horses and mules has reduced the yearly hay requirements for these animals approximately 11,000,000 tons. This reduced need for hay for horses and mules has been reflected primarily in a reduction of the acreage of timothy hay. During the last decade there has been a decrease in the timothy-hay acreage of about 2,879,000 acres, representing a decrease of 25 per cent. During this period there has been an increase in the acreage of alfalfa of 1,909,000 acres, or 21 per cent.

Although the decline in hay-eating animals in relation to hay production has caused the average price of hay to decline, the increasing popularity of and demand for legume hays is indicated by the gradually improved price position of alfalfa and clover hay compared with that of timothy and prairie hay, though legume acreage has increased materially while that of timothy and prairie hay has declined. The maintenance of a large hay acreage in the face of declining price is due to the facts that (1) hay is largely fed on farms where it is grown and therefore many growers have little interest in the price; (2) a reduction in other farm crops usually results in a greater hay production; and (3) in many sections it has a well-established and important place in the crop rotation.

R. S. WASHBURN,
*Assistant Agricultural Economist,
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HAY-STACKING Machines On many farms hay that is Speed the Work, Reduce Costs, and Save Labor stacked is still pitched on wagons by hand and then to the stack, a laborious method in vogue since the scythe and hand-rake days of a century ago. And this in spite of the fact that a stacker enables the hay producer to stack hay more quickly, more cheaply, and with less labor. True, some farmers have used stackers, discarded them, and gone back to hand methods of stacking, but it was probably because of inexperience, inadequate trial, or the use of a light and short-lived outfit.

A comparison of the requirements when stacking by hand and with stackers forcibly illustrates the speed and labor efficiency of the later method. When stacking by hand a 3-man crew is used almost exclusively. With this crew in loading, two men pitch the hay to the third on the wagon. When the load reaches the stack two men pitch it off to the third, who builds the stack. Such a crew will handle about 3 tons a day per man, a total of about 9 tons.

With an overshot stacker the most common crew consists of 2 men on sweep rakes, 2 men on the stack, and 1 to drive the stacker team, a total of 5 men. This crew in alfalfa or mixed hay will average 6 to 8 tons per day per man, a total of 30 to 40 tons. In wild-hay sections where the frontboard and backboard are used in conjunction with the stacker, a crew of 7 men can put up about 50 to 60 tons daily. (Fig. 99.)

Swinging Stacker Speediest

The swinging stacker is perhaps the speediest outfit of its type. A crew consisting of 6 men on sweeps, 2 on the stack, 1 driving the stacker team, 1 raking scatterings, and 1 cleaning up around the stack (a total of 11 men) will put up from 80 to 100 tons daily. (Fig. 100.)



FIGURE 99.—The overshot stacker takes the load from the sweep rake and delivers it over the stacker frame to one point on the stack. In wild-hay sections front and back boards enable one man on the stack to handle the hay which ordinarily requires two men



FIGURE 100.—The head of the swinging stacker carries the hay upward and sidewise and delivers the load to any point on the stack. In the hands of a good operator it has perhaps a greater capacity than any other type

With the combination stacker a 6-man crew is usually the most efficient, and is made up of 1 man on the stacker, 3 on sweeps, 1 on the stack, and 1 to rake scatterings. Such a crew will handle from 35 to 40 tons daily (Fig. 101.)

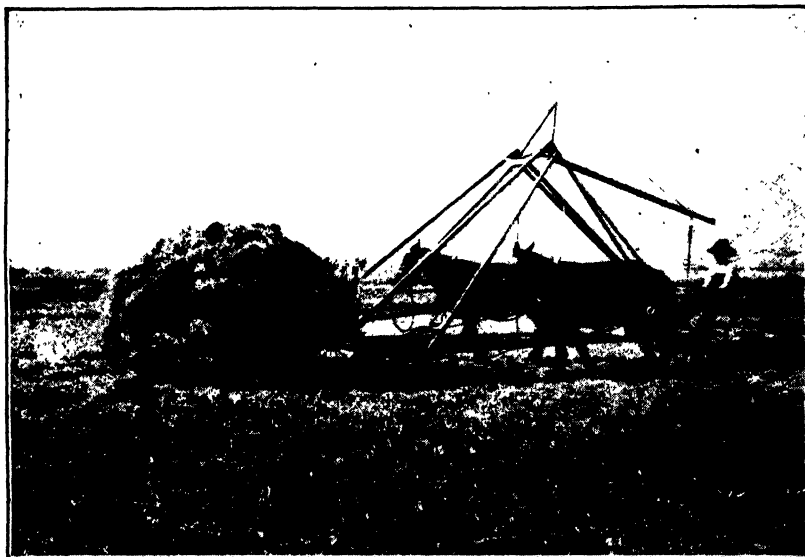


FIGURE 101.—The combination stacker consists of a sweep rake and stacker mounted on wheels. On smooth fields it can be used to take the hay from the cock, windrow, or swath and place it on the stack in much the same manner as does the overshot stacker. Probably its greatest use is at the stack where it takes the hay from the push rakes and delivers it to different points on the stack. This type has a lower daily capacity than some others but its mobility and small operating crew, under necessity, appeal to some.

The slide stacker is a rugged homemade outfit built to handle large quantities of wild or mixed hay rapidly. It requires 2 or 3 men on the stack. When stacking wild hay 3 men on sweep rakes, 1 driving the plunger team, 2 on the stack, and 2 to rake scatterings (a total of 8 men) will put up from 5 to 7 stacks, each of 10 to 12 tons, daily. A

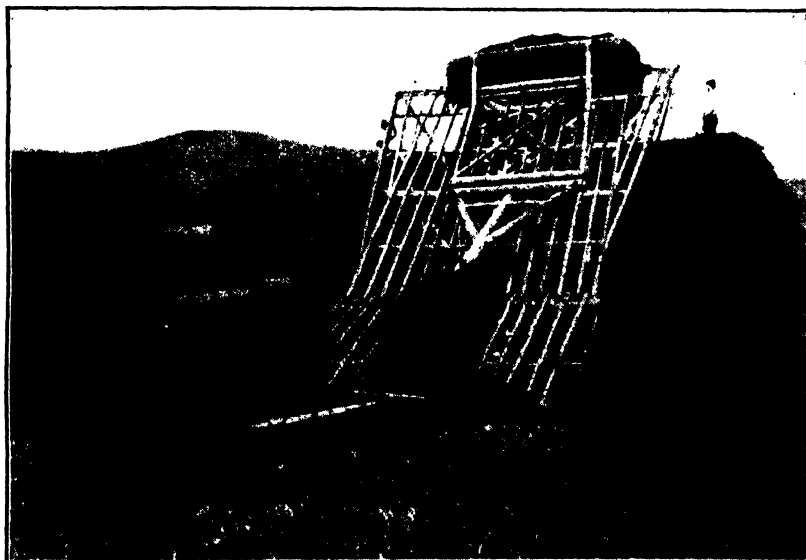


FIGURE 102.—The hay is pushed up the slide stacker with a horse-driven plunger. On large stacks a fan-shaped slide reduces the amount of work needed in pulling the hay to the ends of the stack.

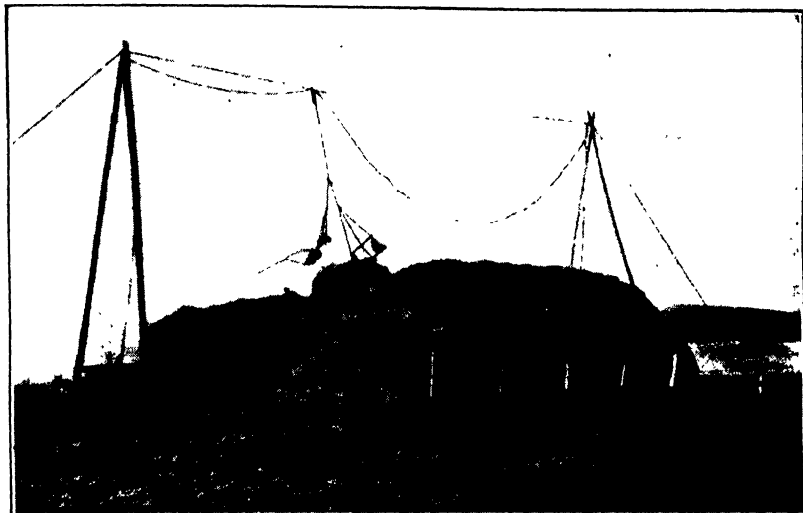


FIGURE 103.—A cable stacker with which a sling or fork is used to unload the wagon at the end of the stack. This type is especially useful when hay is hauled by wagon and stacked in permanent yards close to the feed lots

6-man crew in mixed hay, which eliminates 2 men to rake scatterings, will put up 60 tons daily. (Fig. 102.)

Stacking with a cable stacker is done at about the same rate as when hay is put in a shed or barn with a hay carrier and sling or fork. When sweeps are used, a 7-man crew with this outfit handles 35 to 40 tons daily. With wagons, a 9-man crew is necessary to handle the same amount of hay. The advantage of this outfit is that stacks up to 200 tons can be built at one setting. (Fig. 103.)

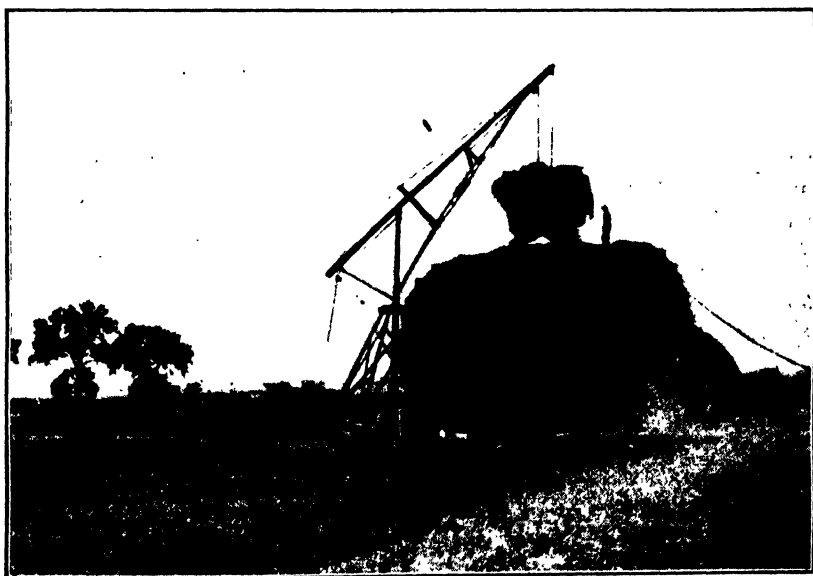


FIGURE 104.—The derrick stacker used with slips excels all other types in handling alfalfa with a minimum loss of leaves and a minimum amount of labor on the stack. It is especially adapted to alfalfa sections where the hay is cured in the cock

Of the derrick stackers, the Mormon style is perhaps the more common and according to operators who use the derrick it excels all others for handling alfalfa. With this outfit and a crew consisting of 3 men operating slips, 1 on the stack, and 1 stacker team driver, about 30 tons can be stacked daily. (Fig. 104.)

The Rope Type

The rope type of stacker, a poor one to use, and limited in its present use to a few scattered localities, has the advantage of cheapness and lightness, but the disadvantage of low capacity. A 4-man crew with this outfit will handle about 16 tons daily. This type of stacker along with others mentioned here is described in *Farmers' Bulletin 1615-F, Hay Stackers and Their Use*.

TABLE 15.—Tons of hay stacked per day per man by different methods

| Method | Men in crew | Tons per day per man |
|---|-------------|----------------------|
| Wagon loaded and unloaded by hand | 3 | 3 |
| Overshot stacker and sweep rakes | 5 | 7 |
| Overshot stacker, sweep rakes, and front and back board | 7 | 8 |
| Swinging stacker and sweeps | 11 | 8 |
| Combination stacker and sweeps | 6 | 6 |
| Slide stacker and sweeps, wild hay | 8 | 9 |
| Slide stacker and sweeps, mixed hay | 6 | 10 |
| Cable stacker and sweeps | 7 | 5½ |
| Derrick stacker and slips | 5 | 6 |
| Rope stacker and sweeps | 4 | 4 |

The human factor requirement for stacking a ton of hay is not the only item governing the choice of methods. When hay is of any importance as a farm enterprise this factor should be given equal consideration with others affecting the practices of handling the crop, if the enterprise is to be a success financially.

L. A. REYNOLDS, *Associate Agricultural Economist,
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HEMORRHAGIC Septicemia Is a Widely Distributed Disease of Livestock

Hemorrhagic septicemia is one of the few livestock diseases that are distributed throughout the entire United States from coast to coast, and from the extreme northern borders to the Gulf of Mexico. Furthermore, it is one of the few diseases that affects practically all species of domestic livestock, as well as many wild animals and poultry. Many outbreaks of this disease, particularly in cattle and sheep, are associated with railroad shipment of these animals. This form of the disease is known as shipping fever and usually makes its appearance a few days after the animals reach their destination. There is little doubt that the shipping lowers the vitality of the animals and they become correspondingly more susceptible to infection.

Although feeder and stocker cattle are most frequently affected, outbreaks of this disease occur also in dairy herds. Sheep, horses, and mules are very susceptible to the infection and as a rule succumb quickly after being stricken. The disease in poultry is known as fowl cholera. Outbreaks occur also in wild deer, buffalo, and rabbits

The extensive losses which the disease has been causing among domestic livestock may be greatly reduced by improved methods of handling and also by vaccination with biological products prepared for the purpose. It is accordingly desirable for livestock owners to be familiar with the nature of the disease and the methods of prevention.

Hemorrhagic septicemia is an infectious disease, caused by a specific germ which may multiply rapidly after gaining access to the body tissues. Outside of the animal body the germ lives in the soil.

Death Rate Is High

The onset of the disease is usually rapid. A marked elevation in the body temperature takes place. Refusal of food and general depression follow. Swellings which are soft and "pit" on pressure may be observed, especially in the region of the throat, neck, and dewlap. There may be difficult breathing or coughing, and a nasal discharge, which at times is blood stained. Strings of mucus frequently hang from the mouth. The disease may spread to the digestive tract, producing in these organs hemorrhages of varying sizes. Such spreading is manifested by a diarrhea which frequently is blood tinged.

The affected animals frequently stand with the forelegs wide apart while the head droops low. The gait is slow and staggering. A rapid loss in flesh occurs, the abdomen becomes "tucked up," and the eyes sink deeply into their sockets. Death overtakes a high percentage of the diseased animals. When recovery does take place, it is slow.

The rapid course of hemorrhagic septicemia together with the swelling beneath the skin may at times cause some difficulty in distinguishing this malady from anthrax or blackleg. Anaplasmosis also has been mistaken for hemorrhagic septicemia. Careful post-mortem examinations, however, reveal the characteristic differences between these diseases.

Effective Control Measures

The causative organism is readily destroyed by the action of the commonly used disinfectants. For this reason the cleaning and disinfection of stock cars and stockyards undoubtedly play an effective part in the control of the disease. It is important, also, to maintain the normal vigor of animals as fully as possible during shipment by proper feeding, watering, and rest and by preventing overexertion, excitement, and exposure.

Susceptible animals may be further protected by the use of bacterial vaccines or aggressins. Such vaccination should be performed 10 days before the animals are shipped, which allows time for the increased resistance to become fully established.

Experimental work conducted by the Bureau of Animal Industry has tended to show that no definite reliance can be placed on vaccination when performed after arrival of animals at stockyards because some of the animals so treated were already infected with the disease in the incubative stage. In these cases the disease frequently ran its course before an appreciable immunity could be established.

Visibly sick animals may be treated with antihemorrhagic septicemia serum. Exceptionally good results have been known to follow the use of this curative serum.

WILLIAM S. GOCHENOUR,
Associate Veterinarian, Bureau of Animal Industry.

HIDES and Skins Have Potential Value Often Lost by Mishandling Hides and skins, particularly cattle hides and calfskins, are among the highest price-per-pound raw material products of agriculture, yet they are often treated by raisers and producers with the greatest indifference and with little regard for their potential value.

The tanner at times pays as much as or more per pound for the best flayed and best cured hides and skins of cattle and calves than the butcher does for the dressed carcasses of these animals. There is, however, no fixed relationship between the market value of hides and skins and the dressed carcasses.

The large meat-packing establishments consider that in the case of cattle an average of about 7 per cent of the live weight and about 11 per cent of the value of the live animal is in the hide. This is recognized, within practical limits, by buyers of beef on the hoof and should always be borne in mind by raisers of cattle.

The tanner buys hides and skins solely to make leather from them. He consequently evaluates hides and skins entirely according to the quantity and quality of leather that they will make. The best hides and skins will yield the best and also the most leather. The tanner is willing to and does pay the best price for them.

The farmer should realize that the hides and skins which he raises are an essential raw material for an everyday necessity, leather. He should also realize that the tanner is the ultimate buyer of hides and skins, and that the returns to agriculture from these products will depend upon their value to the tanner or, in other words, upon their quality.

Factors That Influence Quality

Factors that influence the quality of hides and skins can be divided into two broad classes, those of ante-mortem origin and those of post-mortem origin. The raiser of stock is concerned principally with the first class, which embraces all natural and unnatural causes arising during the life of the animal that affect the physical condition of its hide, including grubs, ticks, brands, mange, warts, sores, rubs, bruises, horn scratches, wire scratches, currycomb scratches, prod marks, muck, manure, etc. Their effect upon the quality and quantity of leather yielded by the hide is considered by the buyer and reflected in his offerings for the animal.

True enough, few, if any, cattle and other stock are ever raised for their hides alone. Yet, thanks to Mother Nature, the raising of hides and skins can be combined conveniently with the raising of meats, dairy products, and wool. While the stockman can not be expected to raise his herds "on nursing bottles and fine-tooth combs," yet, for his own benefit, if for no other reason, he should adopt every reasonable precaution and preventive measure against damage to hides and skins.

The quality of hides and skins also depends greatly upon the way in which they are removed from the carcass and prepared for market. Many small-scale producers still have the notion that a hide or skin is a waste product for which any return is so much gain—a shortsighted attitude. The large meat-packing establishments, which set the standards for hides and skins, realize so well their value that separate departments, under close supervision, are set up for the handling of these products, known as "packer" hides and skins.

"Country" Hides and Skins

"Country" hides and skins, that is, hides and skins from animals butchered by farmers and by country and small city butchers, are on the average of poorer quality, primarily because of indifferent and improper handling during skinning and curing. There are a number of reasons for this condition, some of which are pardonable and some inexcusable. The farmer or very small producer with but an occasional animal to butcher can not afford special facilities and does not have the opportunity to develop the skill and acquire the experience necessary to make a really good job of skinning and curing.

On the other hand, many butchers operate on a scale large enough to justify special equipment and facilities, and continuously enough to acquire the skill and knowledge for producing properly flayed and well-cured hides and skins. Yet many of these producers are quite indifferent as to how they treat or, rather, mistreat the hides and skins that they handle.

Part of this indifference is the result of the fact that they have little appreciation of the tanner's hide and skin requirements. Many of these small producers think that four or five cuts in a hide make no difference or that first-quality leather can be made from a half-rotted skin. Little do they realize that one cut or a hole or hair slip from poor curing may render the whole hide unfit for making into some kinds of leather.

Another cause for this indifference probably is the most serious fundamentally of all the evils in the business. It is the prevailing practice of trading in "country" hides and skins on a "flat" basis, that is, without regard to their quality or condition. Offerings are made at so much for the lot, and all too often they are based on the condition of the poorest hides or skins in it. This practice naturally robs the producer of a direct dollars-and-cents incentive to do his best.

There is an increasing appreciation of the necessity of correcting this evil. The principal hindrance seems to be a disposition on the part of each group of interests concerned "to let George do it."

Producer Should Know Quality

The producer must learn to recognize and appraise condition or quality. As far as possible he must eliminate the causes of poor quality, and he should deal directly with recognized, reputable hide dealers or tanners' representatives. He then will be in a position to insist that his products be bought on selection or according to their quality, and not until then will he realize the maximum potential returns in dollars and cents. The tanner needs all the first-quality hides and skins he can get and he is in a position to pay for them. On the other hand, it is partly the tanner's responsibility, as well as his gain, to see that a system of trading with a direct monetary inducement for quality is set up.

Even in flat buying of country hides and skins, however, the businesslike producer of them will find that there is often some discrimination for quality. The average quality of a producer's hides and skins is soon catalogued in the minds of the buyers. As a consequence, the producers of hides and skins of relatively better quality often find themselves in a worth-while strategic marketing position. When hides and skins are moving briskly, they find competitive bidding for,

their products, and when the market is dull, with few takers; their hides and skins are among the first to move. So even under the present conditions, some producers find that the extra care and attention that they give to produce better quality country hides and skins pays.

It is difficult to understand why another good argument for first-quality hides and skins seems to have but little weight with the raising and producing groups. We all use leather. More than 325,000,000 pairs of shoes alone are made in this country each year, to say nothing of harness, belts, bags, and other commodities made of leather. Moreover, leather articles are usually intended for hard service. Every cut, hole, or score in a hide or skin means less leather, and poorly cured hides and skins mean less serviceable leather goods. Better hides and skins mean more leather, better leather, and cheaper leather.

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Chemist, Bureau of Chemistry and Soils.

HOG Belt's Shift Northwestward Has Economic Reasons Between 1920 and 1925 there was a marked shift in the number of hogs raised in the Northwest. The increase in numbers exceeded 30 per cent in the northern Plains States of Nebraska, South Dakota, Montana, and Wyoming. The increase in Nebraska amounted to 74 per cent, in North Dakota to 71 per cent, and in Montana to 66 per cent. The only other States showing an increase were Minnesota, 14 per cent; Iowa, 19 per cent; Kansas, 27 per cent; Colorado, 9½ per cent; and Idaho 15 per cent; all of which border on the five first mentioned.

Elsewhere in the country the numbers of hogs decreased. In the southern border States, from California to the Atlantic, including the entire Cotton Belt, and northward through Tennessee, Kentucky, Virginia, West Virginia, north to New York and eastward to Maine, the decrease exceeded 30 per cent. Between this group of States and the States showing an increase is a nearly continuous belt of States showing a smaller decrease.

This movement appears to be explainable on the basis of economic conditions. The northern Plains region, where the increase was most marked, is one of high transportation costs to the central markets. But it is well adapted to all the small grains, and recent breeding and selection has resulted in varieties of corn rather widely adapted to the region. Wheat and flax are the only grains sufficiently high priced to permit shipment to distant markets from the region. The other grains are cheap here. The conditions therefore appear to favor pork production. Wheat was rather low priced during much of the period from 1919 to 1925. This was an additional stimulus to the swine industry by lessening competition between it and wheat production. In spite of low prices for hogs during part of the period, they represented the best outlet for much of the grain grown here. The higher price per pound of hogs as compared with the prices of such grains as barley and corn made it feasible to ship them to market.

Development in Accord with Economic Conditions

The development of the swine industry in this region appears to vary with economic conditions, and may be expected to continue unless the price of wheat rises considerably, in which case the swine

industry might cease to grow, or might even become less important than it now is.

The eastern dairy region, the Cotton Belt, and the wide belt of country between the Cotton Belt and the Corn Belt proper are all regions of rather high cost of production for such products. Grain is not abundant and cheap in any of them. Hence the low hog prices that prevailed almost without interruption from 1921 to the late fall of 1924 bore particularly heavily on the swine industry in these sections of the country.

Effects of Fluid Milk Trade

Moreover, the general growth of the fluid milk trade in the north-eastern dairy States robbed the swine industry of one of its common supplemental feeds, skim milk. This increased the cost of pork production. The combination of low prices for hogs and the decreased supply of dairy by-products appears to account satisfactorily for the striking percentage decrease in the number of hogs in the eastern dairy States.

The low prices for hogs and the good prices for cotton that prevailed during most of the period under consideration appear to account satisfactorily for the decreasing importance of the swine industry in the cotton States.

The causes of the decrease in the region lying between the Corn and Cotton Belts are not so evident, aside from low hog prices, and the normally high cost of pork production in the region. This is a region in which dairying is developing rather rapidly; it is possible that farmers here are finding milk cows a more profitable outlet for their feed grains than are hogs. If this is the case, the decrease in the number of hogs is probably permanent, but if the low price of hogs is the main cause of the decrease in their numbers, the movement may be expected to become reversed by improvement of hog prices.

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Bureau of Agricultural Economics.*

HOG-CHOLERA Control Is Aided by Knowledge of Other Swine Diseases To what extent hog cholera will continue to take heavy toll from the swine industry in the future depends largely on the farmers engaged in swine raising. Research work, demonstrations, and practical tests on thousands of farms are convincing evidence that in the preventive-serum treatment swine growers have a dependable safeguard against further losses from hog cholera. Are farmers taking advantage of this safeguard? Are swine raisers of the United States adopting and using the method found, through scientific study and experiments, to be the only reliable means of keeping their swine herds free of cholera? Notwithstanding the fact that State and Federal authorities have for years pointed out the costly ravages of hog cholera and the means of prevention, American farmers still sustain an annual loss of approximately \$20,000,000 from this disease. Figure 105 shows graphically the extent of hog-cholera losses in the United States during the period 1884 to 1928, inclusive.

Serum Treatment Prevents Former Large Outbreaks

A study of this chart shows three great waves of increased prevalence at intervals of from 10 to 15 years.

In the years 1913-14 the use of the preventive serum against hog cholera had become fairly well established, and the smaller losses in those years than in 1886-87 and in 1896-97 were a result, no doubt, of the serum treatment. In the fall of 1926 there occurred another series of extended outbreaks of hog cholera in the States of the Middle West. In nine of those States the losses averaged about 70 per 1,000 hogs. Fortunately, other hog-raising States experienced very little cholera that year. The average estimated loss for the entire country was about 51 hogs per 1,000. Thus the use of anti-hog-cholera serum proved to be effective in checking ravages that might have been a repetition of serious outbreaks occurring in former years.

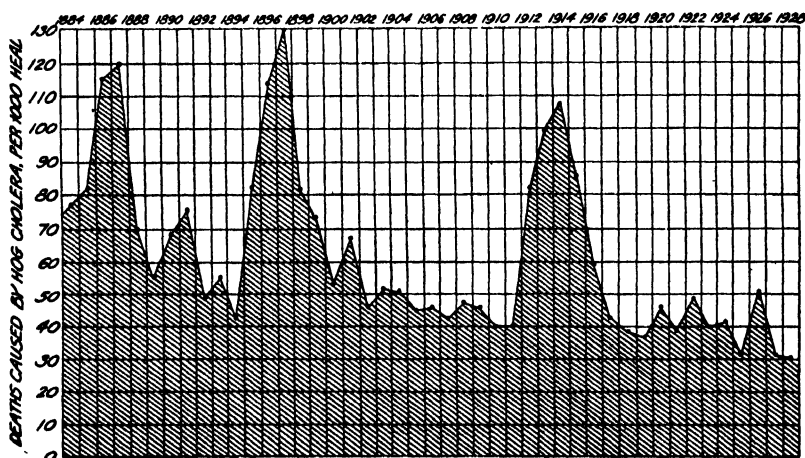


FIGURE 105.—Deaths of hogs, caused by hog cholera, in the United States, 1884-1928

The probable reasons for the apathy of swine owners in protecting their swine herds against hog cholera are interesting to consider. The disease, as already stated, tends to occur in waves of unusual prevalence every 10 or 15 years. In the meantime it appears in sporadic form; outbreaks being rather scattered and, while an individual farmer in a locality may suffer losses, the community as a whole is not aroused to the danger, but lulls itself into a feeling of false security and makes little or no effort toward protection until the next large wave rolls along.

Cost of Immunization Deters Some Farmers

Another reason, probably, is the cost of immunization. Some swine owners believe the cost to be excessive, so that idea tends to curtail the use of the preventive-serum treatment. Untreated herds are susceptible to cholera and consequently are sources of danger to neighborhoods in which the disease is more or less prevalent at all times.

Still another cause of apathy in protecting herds against cholera is the certain amount of skepticism that still exists in farming communities concerning the real value of serum and virus as immunizing agents. From the scientific standpoint it is known that immunization against

hog cholera is entirely reliable. However, there are human elements to be considered and these, at times, have caused the treatment to be ineffectual. An occasional failure is emphasized by the skeptics whereas the many cases of success are ignored.

Diseases Resembling Hog Cholera

Among the causes that may render the serum-preventive treatment ineffectual are: (1) Underdosage of both serum and virus, (2) impotent serum and nonvirulent virus, (3) improper technic in application, (4) lack of attention to feeding immediately before and after treatment, and (5) presence of disease other than cholera in the herd treated. Of these five explanations, in cases where the serum treatment fails to immunize, the last one is the most important.

Several swine diseases closely resemble hog cholera and attention must be given to symptoms and lesions to distinguish them from one another and from cholera. It is important to get all possible information regarding the history of a case before attempting to diagnose the existing disease. The use of anti-hog-cholera serum and hog-cholera virus in herds affected with pneumonia, tuberculosis, swine influenza, necrotic enteritis, or with a severe infestation of internal parasites, is a waste of time and material and may also aggravate the existing condition in the herd. The veterinarian about to inoculate a herd should first ascertain all the facts connected with the case to be treated.

Possibilities of Wrong Diagnosis

In order to show clearly the possibility of error in diagnosis, the cause and symptoms of cholera and of the diseases for which it is sometimes mistaken are summarized briefly, as follows:

Hog cholera: The cause is a filterable virus. Symptoms are loss of appetite, high temperature, listless appearance, arched back, ears and tail drooping, stilty walk, and incoordination of movement in hind legs, cough, occasional thumping, constipation at first, later diarrhea, purple blots on the belly and inner part of the thighs.

Necrotic enteritis: A specific organism, *Bacillus suispestifer*, is associated with the disease, but the underlying or primary cause, as a rule, is allowing hogs to feed on filthy ground in insanitary hog lots and pens. Symptoms are a gradual loss of appetite, profuse diarrhea, weakness, and emaciation. The mortality is high.

Pneumonia: The cause is exposure to cold, wet weather, drafts in shelter houses, inhalation of irritating medicine, or injury to chest walls. A parasite of swine passes through the lungs in its life cycle and may cause sufficient irritation to produce pneumonia, particularly in pigs. Symptoms are prostration, lack of appetite, high temperature, weakness, coughing, and labored breathing. The affected animals are prone to lie with the chest close to the ground in order to get the cooling effect.

Swine influenza (flu): The causative agent has not yet been determined. Symptoms are general prostration and high temperature, cough, rapid breathing, and thumping. The disease affects many animals in the herd but is not highly fatal.

Swine plague: The cause is a specific organism, *Pasteurella suispeptica*. Symptoms are largely those of other pneumonias, namely, prostration, high temperature, cough, and loss of flesh.

Tuberculosis: The cause is the bacillus of tuberculosis. Tuberculosis develops slowly and symptoms are not readily noticeable except in the later stages. Then there are a lack of appetite, cough if the disease is in the lung form and diarrhea if in the intestinal form, weakness, and emaciation.

In view of the many similar symptoms for the various diseases mentioned, the need of accuracy in diagnosis is apparent. The safest procedure is to hold an autopsy on one of the affected animals before attempting to diagnose the disease or outline treatment for the herd. It is advisable to consult a trained veterinarian whose knowledge of animal diseases and anatomy qualifies him for prescribing treatment, and, in the case of hog cholera, to give the correct dosages of virus and serum.

It is important to bear in mind also that immunization is a preventive, not a cure, and that protection is usually cheapest when pigs are immunized before weaning age.

T. P. WHITE,
Senior Veterinarian, Bureau of Animal Industry.

HOG-FEEDING Tests That hog feeders will get better gains
Show that Barrows from the feeding of barrows than from
Gain More than Sows the feeding of sows is the conclusion
drawn from a study of the influence of

sex on feed-lot returns. In order that the results of the study might be conclusive enough to be of real value to feeders, 5,653 hogs, of which 3,018 were barrows and 2,635 sows, were studied during a period of eight years. The barrows out-gained the sows by 5.43 per cent, indicating that the sows from the standpoint of gains in the feed lot were only 94.57 per cent as efficient as the barrows.



FIGURE 106.—Pigs on alfalfa pasture with limited ration of corn

range of climatic conditions and during nearly every month of the year. It included Poland-China, Duroc-Jersey, Chester-White, Hampshire, Spotted Poland-China, Berkshire, Yorkshire, and Tamworth purebreds, as well as a number of crosses between some of these and grades of no known breeding.

Many Systems of Management Included

Hogs under almost every known system of management were included. The results included dry-lot feeding, also hogs on pasture supplemented with limited rations. (Fig. 106.) In some of the experiments a limited ration of barley was fed, followed by a full feeding of

corn; in others this ration was reversed. Such pastures as alfalfa, mixed clovers, and temporary ones, such as rye, oats, wheat, cowpeas, and soybeans, were used to carry the hogs in the study.

In some of the experiments the hogs were full fed from weaning to a weight of about 200 pounds. In others the hogs were started on full feed at weights as high as 150 pounds, and carried along to 500 pounds or more. Practically all known hog feeds, including peanuts and soybeans, were used and the resulting carcasses graded in firmness all the way from oily to hard.

The hogs studied were from sows ranging in ages from 12 months to over 7 years and by boars within the same age limits. Most of the pigs included had been farrowed in March, April, May, September, and October, although a few were farrowed in practically every other month of the year. Some were from sows farrowing but one litter a year, others from sows farrowing two litters.

Results Similar for All Breeds

In compiling the records care was taken not to include animals of either sex unless there were nearly as many of the opposite sex in the same experiment. The object in view was to get definite facts as to the relative ability of both sexes to make gains in the feed lot. All conditions and factors likely to interfere with true results were excluded, so far as possible. The difference in gaining ability in the feed lot was determined by using the average daily gain made during the experiment. The same data showed approximately the same relative differences in average daily gains between barrows and sows in all of the breeds included in these experiments.

E. Z. RUSSELL,

Senior Animal Husbandman, Bureau of Animal Industry.

HOG Marketing Direct from Country to Packer Is Rapidly Increasing About 24 per cent of all the hogs bought by wholesale slaughterers in this country in 1922 were shipped from country loading points direct to packers instead of being bought at public stockyards. In 1928 the proportion of direct purchases in the total had increased to more than 34 per cent. In Iowa, where approximately one-fourth of the commercial supply of hogs is produced, about one-half of the hogs marketed are now sold direct as compared with one-third in 1920.

The increase in direct buying and selling of hogs has attracted widespread attention and has been a subject of great interest to livestock producers, slaughterers, and market agencies in recent years. Much has been said and written about it. This does not imply, however, that it is a new method of marketing. As a matter of fact it was probably the first method of selling livestock in this country, and has been used to a greater or less extent ever since.

With the establishment of public stockyards and the development of large-scale slaughtering plants located near by, the practice of selling livestock through commission agencies at these yards became rather general. Among the first of the public markets established is that now located at Chicago, the world's largest livestock market. It was opened for business in 1865. Public stockyards are now operating in

67 cities. More than half of these, however, are relatively of little importance as markets for the buying and selling of livestock.

With the westward expansion of corn and hog production into Iowa, Minnesota, and the Dakotas there were established wholesale slaughtering plants in this territory far removed from public markets. Even now no public stockyard is to be found between Chicago and Omaha, or St. Paul and St. Joseph, although between these cities is located the most productive hog territory in this country.

Direct Buying Not New

Those who established the slaughtering plants located in this area started buying hogs from near-by farmers and they have continued to buy direct ever since. Their business increased slowly at first, since the concerns were relatively small and the outlet for their product mostly near by, although some of them specialized in the export trade because they were controlled by men who had formerly operated plants in England and Ireland.

At the outbreak of the World War more than half of the commercial supply of hogs was slaughtered in plants controlled by a few large concerns that operated on a national scale. Most of the plants operated by these large packers were located at public markets, or in or near the large cities of the East. Most of their hogs were bought on public markets.

During the war these national packers increased their operations and were actively engaged in supplying meat products for the fighting forces and for export. In the meantime the domestic business of the local packers located away from the public markets was expanding. In the liquidation and readjustment which followed the war these local packers were able to expand operations still further and compete more actively with the national packers. Because of the character of their business the national packers suffered greater financial losses in the price deflation period of 1920-21 than did the local packers whose operations were confined almost wholly to the domestic market and who were buying more nearly on a hand-to-mouth basis. Consequently the national packers were in a much less favorable position to compete in the buying of hogs during the next three or four years. Marked expansion of hog production in 1923-24 in the territory where the interior packers were located provided these local concerns with an abundant supply of hogs close at hand and some of them almost doubled their business.

Policy Stimulated by Reduced Production

When hog production was curtailed in 1925 and 1926 there was a general scramble on the part of all slaughterers to obtain hogs. In order to get their desired quota the large national packers apparently deemed it necessary to place buying agents in the country to buy direct from producers in the same way that the interior packers were buying. The national packers had always bought some hogs direct, particularly for certain of their plants, but now they began to increase their direct buying operations. Not only did they send buying agents into the country to buy direct from producers but they purchased and put into operation several interior packing plants that for various reasons had been unsuccessful under the former ownership. The plants

thus bought were used for slaughtering hogs bought direct. Increased numbers of hogs also were bought direct for plants being operated at central markets, particularly those located at Kansas City and Chicago.

In the meantime the local interior packers who had always bought direct continued to expand their business. Some of these local packers are now slaughtering around a million hogs annually, practically all of which are bought direct and do not pass through the central markets. In the readjustment of the packing industry, to the changing area of hog production, to new levels in livestock prices, to revised freight rate structures, wages, etc., the interior packers located near the source of hog supply apparently have gained advantages over the packers at the central markets. This is borne out both by the expansion of the localized interior packers and by the policy of the national packers in buying or building additional plants in the interior, rather than in enlarging their facilities at the central markets.

Other factors which have contributed to the expansion in direct marketing of hogs are the improvement of public highways with the consequent increased use of motor trucks for transporting hogs, the development of the radio for market-news dissemination, and the better understanding that hog producers now have of marketing in general.

C. A. BURMEISTER,
*Senior Agricultural Economist,
Bureau of Agricultural Economics.*

HOG Weight Affects Yield and Popularity of Market Pork Cuts A farmer scooped the last of the corn from the wagon box into the self-feeder, and cast a speculative eye over his drove of hogs. He noted their uniformity and thriftiness with pride, studied their fatness, and estimated their weight. "I'll let them roll about October first," he said. "They should be ready."

"Ready? Ready for what?"

"Ready to please the packer's eye and to fill the seller's pocket with the top price. Ready to dress out a high yield of carcass and a high proportion of ham, loin, and other high-priced cuts. Ready to give the consumer chops and roasts that he can use with satisfaction."

Every hog feeder faces the same problem and must make a similar decision. To make it wisely he must have certain facts to guide him. Much is still to be learned about the factors affecting tenderness and flavor of pork products. In fact, that type of research has just been started. There are, however, well-established facts that materially assist the feeder who tries to put his hogs in market-topping shape. Type, quality, finish, and weight are all important. Type and quality are more truly problems of the breeding herd and must be considered when the sows are bred.

Points of Preferred Market Hogs

Finish and weight are the prime considerations in the fattening-pen. They are the two characteristics in which the consumer has chief interest. Finer grading on the basis of palatability will doubtless come, but at present market grades of pork cuts and consumer discriminations are largely based on the size of the piece and the amount

of fat it contains. The preferred market hog must be sufficiently big and fat to dress a satisfactory percentage and produce attractive meat, and sufficiently small and thin to yield "apartment cuts" containing a proper distribution of fat and lean. The housewife prefers small chops



FIGURE 107.—In these tests the shoulder was cut three ribs wide

that cut four or five to the pound; she likes half a ham that costs under \$2; she is partial to bacon in which red streaks of lean are prominent.

Given a heritage of type and quality, hogs will be ready for market when they have acquired the proper weight and finish; and weight and finish appear to go together. Variations in the type of hog will provide ex-

ceptions to this rule, but in the main the heaviest shotes are the fattest ones. This fact was clearly shown in the record of 522 hogs dressed and cut at the department's meat laboratory at Beltsville, Md. (Figs. 107 and 108.) Though the animals had received a variety of rations, practically all would have graded No. 1 or No. 2 for their weight. The Duroc-Jersey, Poland-China, and Tamworth breeds predominated with a good representation of Chester Whites and a few Hampshires.

Weights and Dressing Yields

In the lot were 16 pigs that averaged 102 pounds, live weight. They dressed 74 per cent as compared with the 83 per cent of the eighty 289-pound hogs. Two hundred and sixteen medium-weight hogs, averaging 218 pounds, dressed 81 per cent. One hundred and sixty-nine hogs averaged 181 pounds and dressed 80 per cent. The "light lights" averaged 146 pounds and dressed 79.5 per cent. The packer would certainly prefer the high-yielding, heavy hogs if he could sell their cuts as easily as cuts from lighter hogs.

The carcasses from the hundred-pound pigs cut 19 per cent of ham and those from the 289-pound hogs less than 17 per cent. The other groups fitted in between in accordance with their weight. In the same way the lighter hog carcasses cut out a higher yield of loin, rib, head, sausage, and bone than did the heavier ones. The cutting fat, including leaf and back fat from the heavier hogs, weighed over 21 per cent of the cold carcass, that of the 181-pound hogs 17 per



FIGURE 108.—The method used in removing the loin from the bacon strip

cent, and that of the pigs 11 per cent. Bacon yields ranged from 9 per cent in the case of the pig carcasses to 12 per cent in that of the heavy hogs, and the other classes were in between in order of their weight.

A heavier yield of relatively cheap lard and a high yield of over-finished bacon leave the heavy hog with only dressing yield to recommend it to the market. The light-yielding pig carcass produces greater yields of ham and loin but it has a high proportion of head and feet and rib, or what is known as cutting offal. Moreover, its cuts are immature and often hard to store and make attractive.

The medium-weight hog appears to be the one that is "ready" for market. Its yields are a compromise between those of the others. But its chops and roasts will generally please the consumer as to both size and leanness.

Two Hundred Pounds a Desirable Market Weight

No attempt can be made to select the type, weight, and finish that will be most profitable for the individual farmer to produce. Herd-management problems, local conditions, and current markets must all be considered. The stockman should consider carefully the desirability of sending to market a moderately finished hog that weighs in the neighborhood of 200 pounds. That type does not always top the market. Scarcities of other kinds, extremely heavy runs, and the frequent sale of mixed loads often tend to mask the price margins between the various grades. Yet the hogs that sell first, those selected to fill shipping and special orders, and those most eagerly sought at country points, are usually the ones that answer this description. The dressing and cutting yields of the various weights of hogs indicate that this preference is well founded.

K. F. WARNER,

Animal Husbandman, Bureau of Animal Industry.

HONEY Costs Increased by the Great Variety of Containers Used A recent survey of market outlets and demand for honey has disclosed an interesting example of multiplicity of sizes and styles of containers, which increases the necessary cost of distribution.

The situation in New York City is typical of what was found in various retail districts. In 411 retail stores selling honey in the New York metropolitan area, extracted honey was sold in 36 different sizes and styles of containers which ranged from 2-ounce glass jars to 160-pound wooden kegs.

One container, the 2½-pound tin pail, accounted for almost one-third of the total quantity sold by these stores. The 1-pound tin can was second in popularity and the 14-ounce glass jar was third. Over half (56 per cent) of the total quantity sold was packed in these three kinds of containers. A little less than 90 per cent of the total quantity was sold in 12 containers—one-third of the total number.

A total of 19 sizes of containers, on the other hand, was used to sell only 4 per cent of the total volume.

The cost of containers and the cost of handling honey in small quantities are reflected in the prices charged for honey in the various styles and sizes of containers. Generally, honey in tins was from 10 to 15 cents a pound cheaper than honey packed in glass containers of

corresponding size. Honey could be bought most cheaply by the consumer in a 5-pound tin pail, the price of which averaged 86 cents, or 23 cents per pound. At the other extreme was the 2-ounce glass jar, which cost the purchaser an average of 15 cents, or at the rate of \$1.20 per pound for the honey it contained. Surprisingly, no difference in price was made by the average retailer between the 2-ounce and the 5-ounce glass jar, as both usually retailed for 15 cents. Honey bought in 5-ounce glass jars cost the purchasers, on the average, 48 cents per pound.

There are only small differences in the sizes of some of the containers. For example, in the New York district, 14-ounce, 15-ounce, 15½-ounce, and 16-ounce glass jars were found; likewise 6-ounce, 6½-ounce, 7-ounce, and 8-ounce glass jars. There was an apparent tendency to use containers with a capacity slightly less than one-half, three-fourths, or 1 pound, to obtain the competitive advantage of selling honey in a container which appears to the consumer to hold 1 pound, for example, but actually holds 1 or 2 ounces less. There was, however, little uniformity in prices charged for honey in containers varying 1 to 3 ounces in capacity. Occasionally 14-ounce glass jars were sold, as an average for a district, at a higher price than 16-ounce glass jars. Again it was found that the price of 14-ounce jars was so much less than the price of 16-ounce jars that honey in the smaller container actually cost the consumer less per pound than in the larger.

A survey of 294 retail stores in Chicago, made at the same time, showed that honey was sold by these stores in 25 different sizes and styles of containers. Three sizes accounted for 55.6 per cent of the quantity sold, which is almost identical with the percentage found in the New York area. Nine sizes accounted for 90.6 per cent of the total volume, whereas at the other extreme, 10 sizes of containers accounted for only 3.5 per cent of the volume.

The price of honey per pound to consumers in Chicago ranged from 23.8 to 44.8 cents per pound, according to the size and style of container in which the honey was packed. As in New York, honey could be bought most cheaply in a 5-pound tin pail and was most expensive to the consumer in a 5-ounce glass jar. None of these retail stores sold honey in a 2-ounce container.

Summarizing, the consumer who purchases small quantities of honey buys it at an excessively high price. Frequently he pays twice and occasionally four times as much per pound as the price of the same honey in a tin container holding 2½ pounds or more. Honey in glass costs the consumer from 10 to 15 cents more per pound than does honey in tin containers of equal capacity.

A. W. MCKAY,
*Senior Agricultural Economist,
Bureau of Agricultural Economics.*

HORSES and Mules Now Raised Are Much Fewer than Replacement Needs Horse and mule breeders in many States are now protected against the inferior stallions and jacks which were used 25 years ago. While there were many sires of excellent breeding and type at that time, many were only average and others were decidedly inferior. The need

for laws governing this class of animals resulted in the enactment of legislation which now includes 24 States.

Wisconsin took the initiative and passed the first law regulating the services of public-service sires as a means of improving its horses and mules. This law became effective January 1, 1906, and it was the forerunner of similar legislation passed by the States of Iowa, Minnesota, Pennsylvania, and Utah in 1907. Other States followed with enrollment laws until at present the licensing of public-service stallions is required in the following States: California, Colorado, Idaho, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, New Jersey, New York, New Mexico, North Dakota, Oklahoma, Oregon, Pennsylvania, South Dakota, Utah, Washington, West Virginia, Wisconsin, and Wyoming. Public-service jacks must be licensed in all these States except Kansas, New York, and Missouri. Nebraska had enrollment laws for many years but they have been repealed.

Licensed Sires Must Be Healthy

Since the passage of the original Wisconsin statute, changes have been made in various State enrollment laws. They vary considerably in their wording but all have the same intent, namely, the improvement of horse and mule stock through the improvement of public-service sires. One of the most common requirements for licensing such an animal is that stallions and jacks must be sound and free from hereditary and transmissible defects and diseases. To insure this, the sires are subjected to a thorough veterinary inspection before being licensed. Some States permit only purebred stallions and jacks to stand for service, while others allow grade and scrub sires to be used but insist that this information be clearly set forth on the license and on all advertising matter. As an indication that a stallion or jack is purebred, the owner is required to submit its registration and pedigree papers to the State license board. Only pedigree certificates issued by approved societies are acceptable for this purpose.

The State enrollment laws undoubtedly have had a great influence on the improvement of the horse and mule industry. One of the first and most far-reaching effects of the operation of the enrollment laws was the fact that they made available to the public valuable data hitherto unknown regarding sires used for breeding purposes. When the owner of a stallion or jack was required to state its breeding and to post the license at the breeding stand, owners of mares soon became familiar with various blood lines. Moreover, when the sires had served enough mares to make their worth or unfitness known, mare owners had a definite check on the relative merits of different individuals and lines of breeding. All this information has gradually worked for the betterment of the industry, for it has tended toward the elimination of inferior strains and has served to strengthen the position of the purebred sire over its grade and scrub competitors. These facts are evident from enrollment summaries of various States for a period of years. A large decrease has occurred in the total number of licensed public-service stallions and jacks, and the greatest proportion of this decline has been caused by the passing of the nondescript sire.

The passage of the early enrollment laws came shortly before an era of extensive horse and mule production. At that time it was a rather common practice for stallion owners to obtain their sires from abroad. This was particularly true in the breeding of draft horses, and

thousands of imported stallions came into the United States annually. Such importations were made primarily because there were not enough American-bred sires to fill the rising demand and because of the importance which was attached to the sire of foreign breeding.

Greater Percentage of Sires Are Purebred

The magnitude of stallion and jack enrollment in the United States when horse production had reached its heights is shown in a summary of the totals for the year 1915. In that year 18 States had enrollment laws and they had licensed a total of 55,553 stallions of which 59 per cent were purebred and 3,995 jacks of which 30 per cent were purebred. The stallions for five important draft breeds (Belgian, Clydesdale, French Draft, Percheron, and Shire) numbered 27,629.

Contrast these totals with those for the year 1928 when, after a prolonged period of decline, the number of licensed public-service sires in 22 States totaled but 15,775. Many of these sires were of high average age and were well past the period of greatest service. Of these sires 13,811 were stallions and 1,964 were jacks. Of the stallions enrolled 82 per cent were purebred and of the jacks 60 per cent. The 1928 stallion total was composed mostly of draft sires, 10,568 of which were purebreds of six different draft breeds.

The rise and fall of stallion and jack enrollment had a corresponding effect on horse and mule production in the United States. This production reached its greatest development between the years 1918 and 1926. Thus the high point came in the period marking the termination of the World War. The department's estimates of horses on farms in the United States on January 1, 1918, showed a total of 21,555,000 head. This is the greatest number in the history of our horse breeding, and the aggregate value was estimated at \$2,246,970,000. Following 1918 horse population declined annually until on January 1, 1929, the total of horses on farms was estimated at 14,029,000 head, valued at \$981,331,000. These animals were of high average age and were mostly well past the period of greatest usefulness. This depression in horse breeding was brought on principally because war-time operations induced a vast overproduction of horse stock. It also resulted because horse raisers, in view of the relatively low value of their animals, became uncertain regarding the future possibilities of their industry and stopped breeding operations, and because mechanical power had supplanted horses in many instances.

The production cycle for mules has not followed that of horses closely. In 1918 the estimated number of mules on farms in this country was 4,873,000. With the exception of the year 1925 this total was annually increased until in 1926 the high point was reached with 5,740,000 head. Subsequently there has been an annual decline in the number of mules, the total on January 1, 1929, being 5,447,000 head. The decrease in the number of mules, it will be noted, has been much less, proportionately, than that of horses. This may be attributed to the fact that the peak of the mule-production cycle is of rather recent date and because the demand for mules has not been greatly influenced by the substitution of mechanical power. The number of mules may be expected to decrease rather rapidly in the near future, however, unless breeding is quickly resumed. This is indicated by the fact that in the period of 1926-1928 the number of licensed jacks declined one-third.

Present Production Below Replacement Needs

The foregoing data on production and on stallion and jackenrollment indicate that our horse and mule industry has receded to the point where renewed breeding activity is needed to prevent the supply of these work animals from rapidly diminishing in the near future. This becomes especially apparent when it is realized that approximately 500,000 horse colts and 160,000 mule colts are now being raised annually where a million head of horses and 300,000 mules are required for replacements to keep the industry on its present footing.

A factor which may tend to stimulate this production is the fact that prices for both horses and mules have increased slightly during the last two years. Draft horses with size and quality are now in demand and they promise to bring good prices in the future. Among light horses the saddle mount and polo pony are increasing in popularity each year. Such horses are now commanding the highest prices in history. From present indications the mule situation should continue to improve. The demand for mules is greatest in the South and, inasmuch as this section yearly needs approximately the same number of work animals, and because the supply of mules is diminishing, the valuation should continue to rise.

S. R. SPEELMAN,

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INDEXES to Department Publications Must Meet Complex Requirements

A book without an index has been compared to a locked chest without the key; with an index, or a key, the contents are readily accessible.

When the average reader picks up a reference work he expects to find an index in it. He takes that for granted almost as much as he does the numbers on the pages.

Many readers set a very high standard in index requirements. They want the index to be accurate, comprehensive but concise, well-arranged, easy to consult, sufficiently detailed, yet not too involved. They want it to suggest readily what answers the publication gives to the questions that occur to them naturally on the subject treated.

Thus the importance of reliable indexes is very great. Nevertheless, comparatively few people realize the expenditure of time and labor involved in making them. Neither do they appreciate fully the difficulty of good indexing. Both skill and special experience are required, and also an indefinite something called "index sense." An indexer must have considerable knowledge of the subject to be indexed; he must have a clear idea of the scope and general plan of the publication; and must exercise good judgment.

Indexes vary with the type of material concerned and the uses to which the material is to be put. Some are little more than expanded tables of contents; others may be exceedingly minute and may contain innumerable cross references. However, when cross-referenced too much, the whole index may be clouded. In short, the problem of indexing is complex.

The department started issuing printed indexes many years ago. That the work involved is considerable is evident from the fact that

the department prints annually more than 1,700 separate bulletins, periodicals, and other publications.

Cumulative Indexes Issued

At present the department issues a title-page and table of contents for each 25 numbers of Farmers' Bulletins. Cumulative indexes to numbers 1-500, 1-1000, and 1001-1500 have been issued. A title-page and table of contents are issued for each 25 numbers of Technical Bulletins. As soon as 500 numbers have been published, a cumulative index will be printed. A title-page and table of contents have been issued for each 25 numbers of Department Bulletins but no cumulative indexes to this series have yet been published. An index to the series of 1,500 bulletins is now in course of preparation for publication.

A complete analytical index for all publications of the department from 1901 to 1925 (exclusive of periodicals, excepting the Journal of Agricultural Research and the Official Record) now being compiled, will be issued in book form. There are approximately 400,000 cards in this index. Successive shorter indexes will be issued in book form every five years.

In connection with this work, the department periodically issues lists of its publications. In 1927 a list entitled "Publications of the U. S. Department of Agriculture" from January, 1901, to December, 1925, was issued. This comprehensive work, compiled by comparing the titles with the originals, is of value as a separate publication and will be of particular service in connection with the 25-year cumulative index for the same period. Five-year lists will be issued for the periods subsequent to 1925. A 4-page pamphlet, issued monthly, contains brief descriptions of all the new department publications and revisions of older ones which appeared during the previous month. An annual list appears in the Yearbook and will this year be published as a separate.

MABEL G. HUNT,

Editor of Indexes, Office of Information.

INSECTICIDAL Properties of Fluorine Open Wide Field for Investigation In our continual warfare against ever increasing numbers of destructive insects, we can not afford to neglect any materials which seem to offer promise of assistance. Arsenical compounds have been one of the chief reliances of those engaged in combating such pests and still are one of the most effective insecticides. Organic chemical compounds and several plant extracts are also used extensively. Unfortunately, such compounds do not in all cases give satisfactory control, and some of them leave objectionable residue on foods intended for human and animal consumption. This renders necessary expensive and inconvenient methods of cleaning. Arsenical compounds are also objectionable on citrus fruits as the presence of arsenic seems to inhibit the production of the sugar and acid.

At present another class of compounds is being investigated which seem to have distinct advantages for some purposes, namely, the compounds of fluorine.

The discovery of the existence of the element fluorine was first recorded in 1670. Subsequent investigators tried for years to isolate it but without success. This feat was accomplished in 1886, however, by

the famous French chemist, Moissan, who prepared fluorine by electrolysis of a solution of potassium fluoride in liquid hydrogen fluoride.

Under atmospheric conditions fluorine is an almost colorless gas with a pungent odor resembling that of ozone. It can be liquefied at a temperature of -187°C . It is probably the most active element known as it combines more or less easily with all other elements with the exception of nitrogen, chlorine, and some of the rare gases.

The element does not occur free in nature, but its compounds are widely distributed throughout the earth's crust in minerals such as fluorspar, cryolite, mica, and topaz, in rocks, and in hot waters from beneath the earth's surface, and they also occur in sea water, and mineral springs. It is an essential element for plant and animal growth. In man and animals it is present chiefly in the bones, teeth, blood, and milk.

Ample Supply of Fluorine

Commercially, large quantities of fluorine are available as a by-product in the manufacture of phosphate fertilizer. Phosphate rock contains, besides calcium phosphate, fluorspar or calcium fluoride and sand or silicon dioxide. When this mixture is heated with sulphuric acid, hydrofluoric acid is formed, which in turn reacts with the silica, forming gaseous silicon tetrafluoride, which is evolved. As this silicon tetrafluoride is very deleterious to plant and animal life, its diffusion into the atmosphere is prevented by passing the gases through water or solutions of other chemicals, in which it is absorbed. It has been estimated that every ton of phosphate rock contains approximately 60 pounds of fluorine, and as more than 3,000,000 tons of phosphate rock are sold or used annually in the United States, there is an ample supply of fluorine for insecticidal purposes.

Many Problems Still To Be Solved

There are many factors which govern the use of chemicals as insecticides. Among these may be mentioned cheapness, availability, ease and methods of application, toxicity to insects, plant tolerance, adhesiveness, undesirable residues left on plants and fruits and their possible harmful effects on man and animals, ease of removal of these residues, harmful accumulations in the soil when used on field crops over long periods of time, physical and chemical properties, and compatibilities with other insecticides.

As indicated, fluorine is available in very large quantities and for this reason compounds containing it should be relatively cheap. Present methods of spraying or dusting should also be applicable, as many of these compounds are relatively insoluble, finely divided powders with relatively low apparent densities. The toxicity to insects, of the fluorides and fluosilicates especially, has been under investigation for several years with excellent success reported in many cases. Plant tolerance is a factor upon which there seems to be considerable difference of opinion. Differences in climatic conditions in different parts of the country, as well as kinds of crops, rates and times of application, etc., would no doubt have very much influence in this respect. Considerable attention is being given to investigations of the fluorine compounds along these lines at the present time.

Unfortunately, many of these compounds possess physical and chemical properties which render them unsuitable for insecticidal uses.

Some are too soluble, others too insoluble, many are too heavy to dust well, some cause burning of foliage, and others are not sufficiently toxic to insects, but some have been found which give good control of certain insects without injuring the plants. There are many problems yet to be solved in the development of fluorine compounds as insecticides. As there are more than 500 known inorganic fluorine compounds and a much larger number of theoretically possible organic fluorides, the fields for investigation are unlimited.

Fluorine compounds have been used successfully as insecticides for a number of years as a protection against clothes moths, roaches, and chicken lice. They have been tested experimentally against several kinds of insects, such as the cotton boll weevil, codling moth, sugarcane borer, Mexican bean beetle, European corn borer, with results indicating that this group of materials is worthy of further investigation.

It is believed that a satisfactory substitute for arsenic as a stomach poison to insects may be found among the fluorine compounds.

R. H. CARTER,

Associate Chemist, Bureau of Chemistry and Soils.

JAPANESE Beetles Are Caught Plentifully in Geraniol-Baited Traps

During the past several years traps have been used in increasing numbers for capturing Japanese beetles. The primary ingredient of the bait used to attract the beetles to the trap is geraniol, the attraction of which for the Japanese beetle was discovered at the Japanese beetle laboratory in 1923. The use of geraniol bait has made it possible to destroy thousands of beetles, and one trap has a record of having captured over 13,000 in one day.

As the trap which is recommended at the present time captures only one-third of the beetles that are attracted to it, large numbers accumulate in its vicinity, and cause more damage to plants by their feeding than when no trap is present. It is true that many beetles are caught, but the primary object of any Japanese beetle-control measure is to protect plants, and the trap defeats this end by increasing the degree of infestation. For this reason traps are not recommended at this time for use where protection of plants from injury by beetles is desired. Whenever traps are used, one of the poisonous sprays recommended for the control of beetles should be used also, so that the beetles which are not caught may eat the poisoned foliage.

It should be understood that this statement has relation to old and generally infested Japanese beetle areas where the use of traps on an individual property might, for the reasons indicated by the writer, even increase the beetle population and result in greater damage. On the other hand, the use of traps in isolated points of infestation where there is no risk of attracting beetles from the outside reduces the local beetle population by the number captured in the traps or collected near them, and thus may prevent an increase of or even greatly reduce the numbers of beetles for the succeeding year. Similarly, even in generally infested areas, where the use of traps can be made adequate on all properties over a considerable area, the destruction of beetles by this means may result in distinct benefit.

Use of Traps Is Popular

Regardless of the methods recommended for fighting the beetle, the use of traps will always be popular. During the past two years trap-

ping and killing beetles has appealed strongly to the popular fancy in the heavily infested area. There is something fascinating about seeing hundreds of beetles in the traps, and this has resulted in the employment of thousands of traps, especially in the suburbs of Philadelphia and Camden. On the other hand, several gardeners and caretakers on large estates have kept their traps in storage, after having found that it was more difficult to keep their plants free from the increasing number of beetles attracted by the geraniol bait. Except possibly for concerted or regional trapping, poisonous sprays are always better than traps for the property owner who wishes to protect his plants.

There are many types of traps on the market. A number of them have given satisfactory results, but some are of little value. Almost any trap of the funnel type, baited

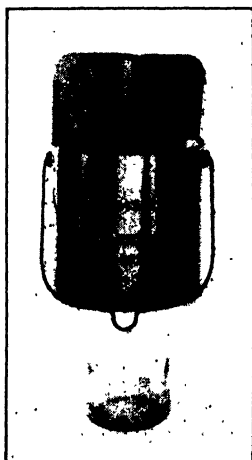


FIGURE 109.—The standard Japanese-beetle trap

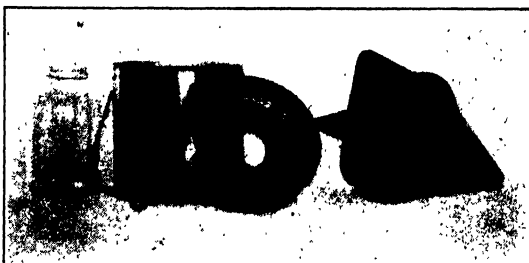


FIGURE 110.—The unassembled parts of the standard Japanese-beetle trap

with the proper strength of geraniol, will attract and capture beetles. The United States Government standard trap, shown in Figures 109 and 110, is the best. Twenty-five thousand of these were used by the Plant Quarantine and Control Administration during the past year in its scouting work to determine the presence of beetles. The efficiency of the trap recommended last year has been increased.



FIGURE 111.—A mound of Japanese beetles containing 1,876 pounds, or approximately 10,000,000 beetles, caught in 500 traps during the summer of 1929

Advantage has been taken of the fact that beetles, after hitting an object while in flight, fall several inches, and a baffle has been placed directly above the funnel opening, as shown in the illustration. (Fig. 109.)

Traps Wrapped with Adhesive Paper

During the past year paper coated with an adhesive paste was wrapped around traps, thereby increasing the number of beetles that were killed. It is planned to recommend an adhesive substance for use with the standard trap. A great improvement was made by grinding a hole in the bottom of the glass container to permit the escape of water and gases.

Recent observations have shown that larger numbers of beetles per trap are caught when the number of traps in close proximity one to another is increased.

Five hundred traps were used on a 15-acre estate in a heavily infested area during July and August, 1929. From these traps 1,876 pounds, or approximately 10,000,000 beetles were taken. (Fig. 111.)

Further experimental work will be conducted to increase the efficiency of the standard trap, and to determine the value of large numbers of traps as a means of beetle control. Information on traps and bait, and their use in capturing Japanese beetles, is available in Circular 146 of the New Jersey State Department of Agriculture.

E. R. VAN LEEUWEN,
Associate Entomologist, Bureau of Entomology.

KITCHEN Improvement in Farm Home Promoted by Extension Service

Large and increasing numbers of home makers are enrolled in the "better-kitchens" project that is carried on in many States through the Extension Service. It has been observed that if George Washington and his wife, Martha, should return to-day to a typical farm in this country, he would be at a loss to know how to use the farm machinery which inventive genius has produced in the past 150 years, but she could step into almost any farm kitchen and feel perfectly at home. She would find few outstanding differences in methods of cooking, baking, and dish washing. Many people are inclined to accept the situation as unalterable.

But the home-economics extension worker realizes that the farm home maker spends more than half of her waking hours in her kitchen in the preparation and clearing away of food, in washing, ironing, and cleaning. She knows that many a farm kitchen is far from efficient and she is meeting with gratifying success in her efforts to do something about it.

The problems facing the extension worker in her attempt to lighten the tasks of the farm home maker may be grouped under three heads:

- (1) Many kitchens are poorly arranged, poorly lighted, and insufficiently equipped.
- (2) There is a lack of money to make the larger improvements.
- (3) Habit has kept many home makers from realizing that more system in the kitchen would release time and energy for other worth-while activities connected with the job of home making, such as child guidance and participation in community affairs.

To overcome these difficulties the "better-kitchens" work in several States has taken the form of a kitchen-improvement contest. Friendly rivalry is utilized as a stimulus to arouse home makers to make changes in order to save time, steps, and energy.

A kitchen score card is in use and the women entering the contest have their kitchens scored on such points as equipment and its arrangement, height of working surfaces, storage space, light, ventilation, and attractiveness.

Methods Used in the Contests

Various methods are employed in carrying on these contests. In some States each woman is required to submit a drawing of the floor plan of her kitchen before she is admitted to the contest. In Connecti-

cut, after drawing the floor plan, each woman uses the score card to score her own kitchen. She then makes another plan showing how she could improve the arrangement to insure greater convenience. The contest usually covers a period of three to six months to allow time for changes to be made. During this period, the extension worker visits the kitchens, if possible, and suggestions are made for improvement. The home makers are told at what height their sinks and tables should be for them. Group meetings are held, and newspapers, circular letters, and the radio are utilized to broadcast the whys and hows of better kitchens.

At the close of the contest the kitchens are rescored and judged, and the awards are made. Prizes are not offered for the finest, most beautiful, and convenient kitchens, because there is a small amount of money available for kitchen improvement in most farm homes. Rather the prizes are awarded on the basis of the greatest number of changes made for the benefit of the housewife and for sincere attempts to secure greater convenience and beauty in the home maker's work shop.

The better-kitchen project reaches its climax when the tour is made to the prize-winning kitchens of the county. A letter of invitation is sent to a large mailing list of women. The men of the family are urged to come, too, for as one woman said, "They are the ones who help us make the changes."

The "kitchen tourists" assemble at the starting point. Banners are placed on each car. The cars form in line and follow the schedule worked out by the home demonstration agent. A printed program is given to each person making the tour. Kitchens to be visited are named and "changes to note" are listed with each kitchen. The most common changes are the following:

- Sinks installed at correct height, with drain board at left.
- Floors refinished and made easier to keep clean.
- Walls and ceiling painted sunny cream color.
- Dark window shades removed; new shades made of light colorful material which allows light to come through.
- Furniture painted; attractive color scheme used.
- Center light raised to ceiling, giving better light and eliminating shadows.
- Table height corrected by use of casters.
- Shelf placed over sink with hooks underneath shelf.
- Equipment placed nearest the place where used most often.
- Dish drainer acquired.
- Kitchen stool in use.
- Wood box on casters.

How Improvement is Effected

When the visitors enter her kitchen, each home maker enthusiastically explains the changes which have been made. She tells an interest-



FIGURE 112.—Farm woman explaining changes made in her kitchen

ing story of how inconveniences endured for years, indeed entirely overlooked until viewed by the eyes of outsiders, have been eliminated. Steps between the kitchen and the dining room have been replaced by an incline in order that her serving wagon may operate. Dull rooms have been made gay with light paint and attractive window shades.

The hostess tells with pride of her husband's interest in her better kitchen and of his eager efforts to assist; how he has elevated back-breaking sinks, ranges, and tables, has reswung doors, put up shelves, and shifted the pump in order that her kitchen work may be made easier.

From Maine to California the women enrolled in the better-kitchens work are enthusiastic about the results. One says, "My kitchen is

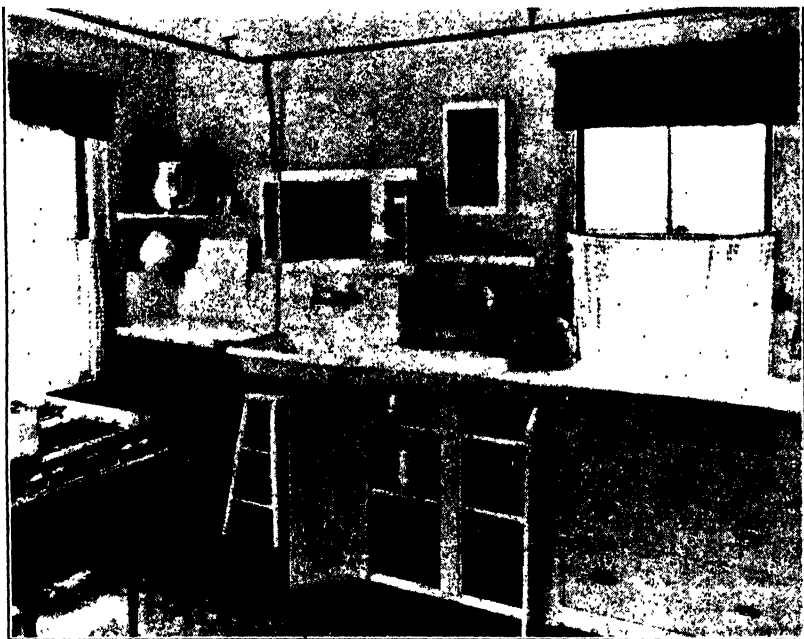


FIGURE 113.—Corner of a farm kitchen showing sink and cupboard arrangement

now a joy to work in, pretty, easily kept clean, and a great satisfaction to me and my family." Another says: "How much easier it is to work in my newly arranged kitchen. Now I can make a cake, taking just half as many steps as were formerly required, all because of rearranging equipment and utensils."

Another reports: "The most delightful change in my kitchen is the color scheme. From a cold, dull room it has been transformed to a lovely sunny place that satisfies my desire for beauty. I have truly come 'out of the darkness into the light.'"

The touring visitors are impressed with the fact that women who have taken part in the contest, making changes in accordance with suggestions given, are saving themselves an average of 200 steps a day. They are impressed with the small cost of these changes, and find that a little money with a great deal of thought and some hard work have

produced wonderful results. The fact that the home maker herself, rather than the extension worker, tells the story of the changed kitchen is an effective bit of psychology. In telling the story the home maker increases her own self-confidence and commits herself to the practices she is discussing. The visitor listens to the account of changes made and thinks of it as the experience of a fellow worker. Seeing what has been accomplished, she is inspired to go and do likewise. The kitchen tour makes new friends for the Extension Service. Women become acquainted with that phase of the work, and they ask to have their kitchens studied and suggestions made for changes.

Slight Changes Effect Much

In making over these farm kitchens, in rearranging equipment, and in introducing color by means of bright paint and hangings, some of the changes made may seem trivial, but who can tell what a change was made in Mrs. Jones herself when the step between the kitchen and dining room was removed, allowing the use of a service wagon? Who can tell the light that was shed throughout the entire household of Mrs. Brown when a dark kitchen was made to gleam with extra windows and bright paint?

An Iowa woman describing her kitchen said:

Dreams do come true! My remodeled kitchen is a reality. After 15 years of hoping and waiting and saving, my one year's kitchen study with the Extension Service showed me the possibilities of a convenient kitchen which would suit my needs and my pocketbook.

A Kansas woman said about her remodeled kitchen:

You ask "Who helped do the work"? If you change that question to "Who did the work"? I can answer in two words "my husband." Perhaps I furnished the inspiration but he provided the man power and the brain power. We planned it entirely together, and he did the work in his spare time. The new conveniences shorten my hours in the kitchen, so I now have more time with my children and for many other things, namely flowers, reading, interior decoration, and friendly visits with my neighbors.

FLORENCE L. HALL,
Home Economist, Extension Service.

LABELS on Food Packages a Safe Guide to Buyer if Text Carefully Read

Labels on packages of food products, while still vying with one another to attract the buyer's roving eye, now carry truthful statements as to the nature of the contents, thanks to a strict enforcement of the Federal food and drugs act for nearly a quarter of a century. And it is the hard cold facts set forth in these statements—not the appeal to one's sense of the esthetic made by the designs accompanying them—that permit a sound selection of one out of several cans, cartons, or bottles of any particular product. Not that these designs are misleading. The Federal food and drugs act forbids the use of misleading designs or devices just as emphatically as it does the use of untruthful statements about the character of the product described. Pictorial representations, however, can not tell the whole story.

Take, for instance, two No. 2 cans, both bearing attractive pictures of large red tomatoes, but labeled in one case "Tomatoes" and in the other "Tomatoes with Puree from Trimmings." As the can labeled

"Tomatoes" usually costs more than the other, it may be passed over as an extravagance. But let us look a little further. "Tomatoes" are tightly packed in the can, with no juice except that natural to them. The others are put up with a certain quantity of added liquid obtained from tomato trimmings. Both articles are wholesome but the use to which the tomatoes are to be put would seem to be the determining factor in the purchase.

Canned-Corn Labels

Canned-corn labels also have their little peculiarities. Maine packers for many years have prepared corn for canning by scraping it from the ears in a creamy mass, whereas some Maryland canners cut it off in such a way that the kernels remain more or less intact. Those who specially like a creamy corn, then, will buy "Maine corn," or "cream corn," the name given to corn put up by the same process in any of the other States. Corn canned by the Maryland method is labeled "whole-grain corn." Labels on canned corn, or any other canned vegetable for that matter, may state the variety packed, as "Country Gentleman" or "Golden Bantam" corn. The pure food law does not require that the variety be declared, merely that if declared it be a truthful declaration.

The word "stringless" on a can of beans does not necessarily specify a particular variety, but is used to define a high-grade pack of beans put up at a certain stage of growth before the "strings" develop.

The term "soaked dry beans" or "soaked dry peas," frequently appearing on cans of these widely used vegetables, is designed to spare the buyer any illusion that the can contains vegetables packed while young and succulent. "Soaked dry" vegetables are those that had become so mature and dry before canning that it was necessary to soak them.

And how about that little phrase "preserved with 0.1 per cent of sodium benzoate" or "contains 0.1 per cent of sodium benzoate" that once appeared on many cans and bottles of preserved fruits and vegetables and is still used to some extent? Owing to the restrictions which the food and drugs act places on the use of preservatives and to the natural prejudice of the consuming public against their presence in food, we encounter these declarations much less frequently nowadays than a few years ago. As refrigeration facilities and other approved methods for preventing decomposition are further developed, the use of preservatives will be even less prevalent. Manufacturers, however, still feel that a preservative is necessary for many fruit juices, sirups, and sodas and also for dried fruits. Sulphur dioxide is the preservative commonly used in dried fruits; sodium benzoate is the one for the other products. The presence of a preservative in any food product must always be declared on the label, making it possible for those having a distaste for artificial preservatives to shun them.

Labels on Bottled Beverages

The labels on bottled beverages, which until recently were most misleading, are now very generally truthful. Here we have three main classes: (1) True fruit products, either straight or somewhat diluted; (2) fruit-flavored products, the flavor being either true fruit

juice or pulp or an oil or extract made from the fruit; and (3) imitation-fruit products, the flavor of which is either entirely or predominantly synthetic.

Thus a bottle labeled "Grape Juice" will be found to contain straight fruit juice. Bottles labeled "Grapeade," "Grape Squash," "Grape Punch," "Grape Crush," or "Grape Smash" must contain a material percentage of grape juice with or without added water and sugar. Labels for such products may be garlanded with clusters of grapes or with grapevines. A "grape-flavored sirup" is labeled to show whether the flavor is derived directly from the grapes themselves or from an extract prepared without material chemical change from the fruit. The third general class, "imitation grape sirup," as the name implies, owes its flavor to a synthetic grape flavor instead of a true grape juice or true grape extract and its color is artificial. Even though it contains a small percentage of true grape extract, it must be plainly labeled "imitation." It is not entitled to any pictures of grapes and grapevines on its labels.

It is, of course, impossible to consider here the infinite variety of labels under which fruit and near-fruit beverages are offered to the public. A careful scrutiny of the label, however, should leave little doubt in the mind of the buyer as to whether a juice or a sirup is the real thing or a substitute. What has been said about beverages holds true also for hard candies and chewing gums, most of which are of the fruit flavored or imitation fruit variety.

Varied Designations for Salad Oils

Salad oils come under many and varied designations. Commanding a higher price and enjoying a wider popularity than the other vegetable oils, olive oil is always plainly labeled to show that it is the product of the olive and its labels are usually adorned with pictures of olive trees or groves or with Italian emblems of one sort or another. The presence of olive oil in mixtures, even though only in quantities large enough to add flavor, is invariably made known on the labels. Cottonseed, corn, peanut, and the other cheaper vegetable oils may be sold as "salad oil" or as "vegetable oil," the oil or oils present being mentioned or not according to the fancy of the packer.

The salmon packed in enormous quantities each year may be any one of five distinct species, each with certain characteristics that affect the texture and flavor of the fish in the can. The label, of course, does not attempt to give the scientific names of these species, but it usually gives the common names, which are as follows: (1) "Chinook," or "king," (2) "sockeye," "blueback," or "red," (3) "coho," "silver," "silversides," or "medium red," (4) "pink," (5) "keta," or "chum." The price and quality are in the order named. Spring-caught Chinook salmon from the Columbia River, deep pink and rich in oil, is generally considered to have the finest flavor and for that reason brings the highest price. Most dealers prefer Puget Sound red salmon to the red salmon from Alaska. Coho is lighter in color than red salmon and not quite so generally satisfactory in several other qualities. Pink salmon contains less oil and is rather soft, but its flavor appeals to many. Chum salmon is whitish and frequently is slightly less firm and has a low oil content.

"Sardine" is General Term

The term "sardine" does not, as many people seem to think, designate fish of a certain species, but is applied to any small fish of a very large family. The name is derived from the island of Sardinia, around which in the waters of the Mediterranean Sea abound the fish from which sardines in that region are made. Sardines are imported from Norway and France and are also put up in large quantities in California and along the New England coast, principally in Maine. The labels on these canned fish usually name the country or State of their origin and also mention the oil in which they were packed. Those packed in olive oil are more expensive than those packed in the other vegetable oils. Sometimes the name of the cheaper oil is given on the label, but usually only the words "packed in vegetable salad oil" or "packed in salad oil," without specifying the exact oil, are employed. These expressions signify cottonseed, corn, peanut, or some other vegetable oil. Mineral oils are not allowed in food products.

Labels also permit a clean-cut distinction between canned lobster and canned crawfish. The term "lobster" unqualified or accompanied by some geographic name, such as "cape" or "Pacific," denotes true lobster. The terms "spiny lobster" or "rock lobster," however, signify that the contents of the can are a species of crawfish, and the labels on which they appear may not bear pictures of lobsters.

Although truthful labels on food products are to-day the rule rather than the exception and can very generally be depended on to show the real character of the contents of bottle, can, or carton, some that violate the provisions of the Federal food and drugs act in one way or another are constantly cropping up. Steps under Federal or State pure food laws are at once taken to have these labels revised. Correcting them is only half the battle, however. To serve the purpose for which they are designed, they must be carefully and intelligently scrutinized by buyers.

KATHARINE A. SMITH,

Editor, Food, Drug, and Insecticide Administration.

LABELS on Veterinary Drug Preparations Should Be Studied

Close scrutiny of the label on a commercial drug preparation to be used in combating any livestock or poultry disease may save farmers and ranchers some money and much trouble. The enforcement of the Federal food and drugs act and the insecticide act, in conjunction with the active cooperation of honest manufacturers, during the last few years has gone far in eliminating the worst frauds at one time prevalent in the sale of veterinary drug preparations, but much still remains to be done in this field. Whether strictly within the law or on the border line between fact and fancy, however, labels can serve as a very useful guide in reaching a wise decision in buying a medicine or insecticide for livestock, pets, or poultry.

In the first place, according to the consensus of present-day reliable veterinary medical opinion, there is no drug or mixture of drugs now known that can be regarded as an adequate treatment for contagious abortion of cattle, hog cholera, hog flu, fowl cholera, diarrhea of

chicks, coccidiosis, roup or diphtheria, gapes of chicks, chicken pox, blackhead of turkeys, distemper of dogs, black tongue and running fits of dogs, influenza, distemper, and heaves of horses. Obviously, then, buying any drug preparation sold for such ailments not only is a waste of good money, but, what is even more serious, gives rise to a false sense of security which may cause so long a delay in adopting proper preventive measures as to permit the disease to spread throughout the entire community. No honest and well-informed manufacturer will represent on his labels, in his circulars, or in his advertising that his preparations will prevent or cure any of the foregoing animal or poultry diseases.

Claims Made for "Worm Expellers"

The claims made for the so-called worm expellers also call for consideration before any buying is done. Critical tests by the Department of Agriculture have shown that many drugs reported in the dispensaries as having worm-expelling properties are not effective for this purpose. Manufacturers of such preparations have been warned to acquaint themselves with the latest developments in veterinary science and to refrain from making efficacy claims that have not been substantiated by critical tests by competent scientists. A product may be capable of expelling worms of one type, but no drug or mixture of drugs known to-day can be depended upon to act as an effective vermifuge against worms of all types that infest animals and poultry. The unqualified use of the term "worm expeller" or "vermifuge" in labeling these preparations, therefore, is a violation of the food and drugs act. The specific name of the worm or worms against which the preparation is known to be effective must be prominently set forth in the label.

And the same thing holds true for "mange cures." It has been definitely established that, although certain drugs are effective in the treatment of some types of mange, none yet known to science is an effective treatment for other types, including demodectic or follicular mange. Under the terms of the Federal food and drugs act the labels on these preparations must show clearly the type of mange or scabies against which they are known to be efficacious and under the terms of the insecticide act they must include the name and percentage of each inert ingredient or the name and percentage of each active ingredient and the total percentage of inert ingredients.

"Lice and Mite Killers"

"Lice and mite killers" also come under this category. Certain preparations recommended indiscriminately by their makers for the elimination of both lice and mites have been found by actual test to be effective against lice, but not against mites of any type. Others sold for use against lice in general have proved on examination to be capable of destroying lice of only one type, the biting type, not the blood-sucking type. Hence to meet the requirements of the law a label bearing claims for the elimination of mites or lice must be explicit as to the kind of mite or louse that will succumb to any particular application. A knowledge of which parasite is involved in any affection would seem a prerequisite to the intelligent selection of the remedial measure to be adopted.

Preparations which when administered to poultry internally would destroy all external parasites enjoyed a brief vogue in the rural sections of the country. Their doom was sealed, however, by a court case in which the jury returned a verdict sustaining the Government's contention that lice and mites would not be removed from poultry by adding to their drinking water a weak lime-sulphur solution.

Government officials maintain a constant surveillance over traffic in remedies for livestock and poultry to prevent frauds against the agricultural interests. Individual buyers, however, can greatly advance their own interests by carefully considering the labels on the remedies they propose buying before they hand their money across the counter.

H. E. MOSKEY,

Veterinarian, Food, Drug, and Insecticide Administration.

LAMBS Born Twins Are More Profitable than Singles, Figures Show Sheep raisers throughout the United States are depending more and more on the meat of the lambs produced, as a source of return from their flocks.

This is true of the range sheepman as well as the farmer who keeps a small flock of sheep. The natural tendency of ewes of the English mutton breeds to produce a certain percentage of twins is quite a desirable trait to some producers while others maintain that single lambs are stronger, grow out faster, and can be marketed earlier and at greater weights. Sheepmen of the latter opinion are in favor of producing singles and often dispose of the weaker of a pair of twin lambs immediately in order that the other lamb may have the benefit of all the milk produced by the ewe.

Much may be said on either side of this question. Some ewes are not able to produce milk enough to develop twin lambs satisfactorily. If both lambs are left with such ewes both will be stunted and possibly be less valuable at marketable age than one of them would have been had it received all the ewe's milk. On the other hand, some ewes in the flock are almost sure to lose their lambs at lambing time or within a few days thereafter. Since these ewes will be in better condition for breeding the next fall if they raise lambs, the twins which are not doing well can in this way be divided.

Weights of Twin and Single Lambs

Even under the best of management the twin lambs do not look so plump nor develop so rapidly while young as do singles. However, after they are older and depend more on feed other than their mother's milk the twin lambs often develop quite rapidly and in some cases become larger than the average of the single lambs. (Fig. 114.)

Data compiled from the Government's purebred Southdown flock at Beltsville, Md., for the eight years from 1921 to 1928, inclusive, show that the average weight of twins at the ages of 3 and 6 months was less than the average for single lambs. The average of all single lambs at 6 months was 72.5 pounds, while the average of all twins was 63.4, or 9.1 pounds less. Yet the fact that lambs are usually raised largely on pasture and cheap feed and marketed before stored and harvested feeds must be used makes the advantage of 126.8 pounds live weight of lambs per ewe in the case of twins a considerable one when compared with the 72.5 pounds per ewe, for those producing singles.

If the single lambs would bring 15 cents a pound on the market, they would average \$10.87 per ewe, whereas the twins even at 13 cents a pound would bring \$16.48 per ewe, a difference of \$5.61. This is more than 50 per cent greater return than from the production of single lambs.

Ewes with Twins Give Greater Net Returns

A pair of twin lambs, although smaller, will consume more feed than a larger single lamb. Figuring the annual maintenance of the ewe at \$8 and the cost of feed and pasture at \$3.60 per lamb, there would be a total cost of \$11.60 associated with raising a single lamb, and \$15.20 with raising a pair of twin lambs. Estimating the value of the fleece at \$3 (7½ pounds at 40 cents) the ewes producing a single lamb would

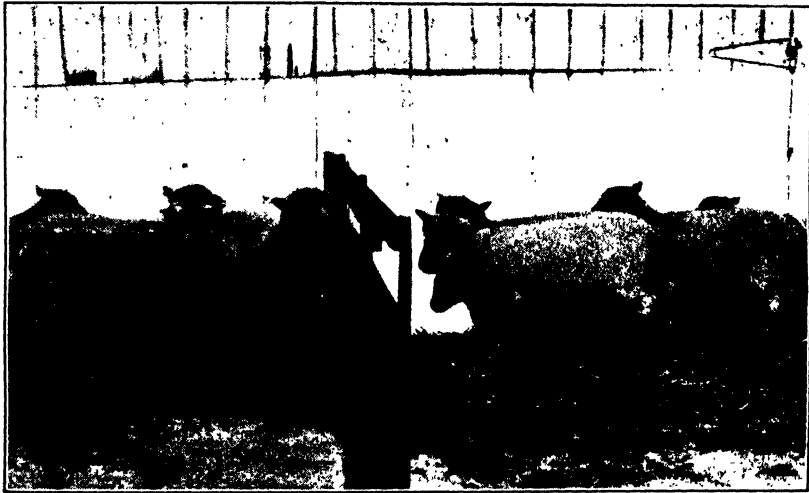


FIGURE 114.—Lambs to the left of the hurdle were singles receiving all the milk produced by their dams. Those to the right were born twins and raised as such; that is, two lambs nursed one ewe. All were approximately 6 months old when photographed

produce a total return of \$10.87 (value of lamb) plus \$3 (value of fleece), or \$13.87, from which the cost of \$11.60 would leave \$2.27 net profit. In the same manner, adding the fleece value of \$3 to the value of the two twin lambs (\$16.48) we get a total return of \$19.48. Deducting the cost of production and maintenance (\$15.20) leaves a net profit of \$4.28. This figure is within 26 cents of being twice as much net profit per ewe as in the case of ewes raising only single lambs.

C. G. POTTS,

Animal Husbandman, Bureau of Animal Industry.

LAW Administration by Department Raises Some Unique Problems

On every hand the officials of the department are confronted with questions of law or legal controversies. These matters are handled by a staff of lawyers. Many of the cases considered are unusual, while others might be regarded as routine, although most of the latter develop unique points of law or fact. The legal field of the department is very

broad. The case under consideration may involve the vindication of a Federal inspector or employee in the performance of his duties, the recovery of damages due to the destruction of Government property, the retention of lands which have been put to a public use, or one of many other situations which are constantly arising.

Federal grain inspectors sometimes discover a "plugged" car of grain presented for inspection under the United States grain standards act. This deceitful advantage taken of the purchasers of the grain may endanger the license of the inspector who graded the grain. A car is ordinarily plugged by placing an appreciable amount of distinctly low-grade grain in the bottom of the car to a depth of approximately 2 feet and covering it with grain of a much better quality. The probe of the inspector may be avoided by the location of the inferior grain, and the added precaution of heavily loading the car in such a way that even if the inspector probes at the proper place he will not reach the inferior grain unless suspicion prompts him to dig a trench in the top of the load, and probe to the bottom of the car.

Experience has demonstrated that the discovery of one plugged car is sufficient reason to identify all cars of the same shipper at the particular inspection point and to sample them with extreme diligence. Once the venture has been decided upon, a shipper usually executes his plan on a number of cars. A score of cars of grain, all efficiently plugged, shipped by the same concern to the same market, may be discovered by the Federal supervisor after the cars have been assigned a high grade by a licensed grain inspector. These inspectors are held to strict accountability and are responsible for the samples on which their grades are based. Under the department regulations, the grade of the entire car is based upon the plugged portion, which in itself may be a severe penalty on the shipper. When it is found that an inspector has misgraded a lot of grain, his fitness for the position which he holds is under scrutiny, and his license is suspended or revoked unless his failure properly to grade the grain is satisfactorily explained. Generally, in such cases, a hearing is held to determine the reasons for the incorrect inspection, at which the shipper is given an opportunity to explain the manner in which the cars were apparently loaded.

Prosecuted Officer Vindicated

Government officers or employees are often criticized as having been overzealous in discharging their duties. However, it is always well to await a determination of the facts before condemning the officer of having acted without authority, or maliciously. In the administration of its regulatory laws, the department meets many problems. Some of our national forests were infested with so-called wild horses to such an extent that it became necessary to take steps to protect forest forage and young growth. Regulations were promulgated providing for the impounding and disposition of such animals. Ranger Joseph T. Fears of the Apache National Forest, Ariz., was arrested and found guilty on a charge of maliciously killing an animal. This charge resulted from the ranger's having disposed, by shooting, of an unredeemed horse taken up and impounded in accordance with the department's regulations. The State court held that the defense that he acted under such regulations did not justify an acquittal on the ground that the regulations were contrary to the spirit of the Constitution and the laws of our

country. On appeal, however, the supreme court of the State reversed the lower court and ordered the ranger's discharge from custody, pointing out the evident truth that the ranger, having complied with the procedure prescribed by the regulations, could not be said to have acted maliciously.

Vast areas of land in the United States are reserved for national-forest purposes. Some of these lands are very valuable and are viewed with longing eyes by those who are not interested in the conservation of the national resources. While many of the public-land laws do not apply to these forest lands, they may be acquired under the mineral laws of the United States if of the required character. A prospective entryman may want the land for its timber value, or for the location of a gas station, or for its recreational value, but if his object be any of these, it must be concealed and he must base his entry upon the presence of a valuable mineral. The Little Beauty placer mining claim was located on the Tusayan National Forest, Ariz., by virtue of an alleged deposit of facial beauty clay. However, the entryman failed to convince the land department of the efficacy of the clay. It was held that the material was ordinary clay exhibiting no particular valuable properties.

Fire Hazard from Oil-Burning Engine

Can an oil-burning locomotive set fire to forests? The United States Department of Agriculture asserted that it could, and its view was upheld by the United States District Court for the Northern District of California in the case of *United States v. Feather River Lumber Co.*, in which judgment in the amount of \$41,575.80 was rendered. The action was based on a fire that occurred on the Plumas National Forest, Calif., alleged by the Government to have been caused by an oil-burning engine operated by the company. Oil-burning engines are used to minimize fire danger, and it was necessary to show that they are capable of setting fires.

Considerable difficulty was experienced in obtaining expert testimony in this particular because of the fact that those having expert knowledge are ordinarily railroad men who are reluctant to jeopardize their standing with railroad companies by testifying. Attempts to obtain favorable expert testimony on the subject in the East met with failure, the prevailing view being that the possibilities of such an occurrence were so remote that actual demonstration before the eyes would be required. This the department did not have. However, upon the evidence obtainable, the court held that an oil-burning engine is capable of starting a fire upon a right of way, especially when it is being sanded out with a resulting shower of sparks, carbon, and fire-box clinkers. The opinion is also of unusual interest in that the court held that the Government was entitled to recover for the damage arising out of the destruction of young growth on the basis of reforestation cost, and that the rule that the measure of damages is the difference in the market value of the land before and after fire is not applicable, since the national forests are not marketable. Upon appeal by the defendant, the decision below was affirmed by the higher court.

H. N. FOSS,
Attorney, Office of the Solicitor.

LAWNS Protected by Lead Arsenate from Beetle-Grub Injury The grubs of the Japanese and the Asiatic beetles live in the soil and feed normally on grass roots immediately below the surface. Throughout the areas of the United States where these beetles are found, they have caused severe damage to lawns. When there are only a few grubs feeding on the roots, the injury to grass may be so slight that the presence of the grubs is not suspected. When patches of dead grass are noticed within an infested area, a careful examination should be made to determine whether the injury was caused by grubs or by lack of water, poor soil, poor drainage, or disease. If caused by grubs, five or more grubs will be found feeding within a space of 1 square foot. The light areas in the lawn shown in Figure 115 are patches of grass which have been killed by grubs.



FIGURE 115.—A lawn injured by Japanese-beetle grubs

It has been found possible to protect both new and established lawns by treating the soil with lead arsenate. This chemical is a white, impalpable powder which is widely used in the control of leaf-feeding insects. It is poisonous to man when taken internally. Care should be taken not to inhale the powder, and the hands should be washed thoroughly after handling it. There is little danger to man or to animals after it has been applied to the soil.

When building a new lawn in the areas infested with these beetles, it is recommended that the land be prepared for seeding, then treated with lead arsenate at the rate of 35 pounds per 1,000 square feet of soil. The chemical may be sifted or broadcast by hand, or it may be applied by means of a fertilizer spreader. After the poison has been raked into the soil until it is uniformly mixed to a depth of 3 inches, the grass seed may be sown, and the land rolled and cared for in the usual manner.

Prompt Action Recommended

When injury by grubs begins to show in an established lawn, it should be treated at once. If a portion of the lawn has been killed, the dead grass should be dug, the soil poisoned, and the plot reseeded the same as when building a new lawn. The portion of the lawn where the grass has not been seriously injured should be top-dressed several times with a mixture of lead arsenate and soil, to build up gradually a poisoned layer at the surface. Use 5 pounds of lead arsenate and 1 bushel of moist soil for each 1,000 square feet of lawn to be treated, and mix as follows: Spread the soil about 3 inches deep on a cement floor or other hard surface, and spread the lead arsenate on top as shown in Figure 116. Turn the mass over with a shovel until the ingredients are thoroughly mixed, after which it may be broadcast by hand or applied with a fertilizer spreader.

The lead arsenate may be applied at any time during the growing season. New lawns are usually treated during early spring or early fall, just before the seed is sown. The top-dressings are usually applied at least twice during the growing season until a poisoned layer has been established.

Lawns which have been treated with lead arsenate should not be fertilized with sodium nitrate, potassium chloride, or potassium sulphate; but organic manures, ammonium sulphate, urea, cotton-seed meal, and activated sludge may be used.



FIGURE 116.—One bushel of soil and 5 pounds of lead arsenate ready for mixing

Lead-arsenate treatment of lawns in suburban districts is a practical method for controlling Japanese and Asiatic beetle grubs. Since the area of the average suburban lawn is less than 3,000 square feet, it would require less than 100 pounds of lead arsenate to poison the soil of a new lawn to a depth of 3 inches, and the cost should not exceed \$15. This would protect the grass roots from injury by grubs for a period of four to five years. To top-dress an established lawn with lead arsenate and soil would cost proportionately less.

WALTER E. FLEMING,
Entomologist, Bureau of Entomology.

LEASED Farm Land in U. S. Two-fifths Greater in 1925 Than in 1900

It is costly for a man with limited funds to attempt farm ownership. Property in farm land gives low returns on the values involved as compared with property invested in the operation of a farm.

With the same capital it is possible to operate a much bigger farm and do a much bigger business as a tenant than as an owner. Perhaps, in part, increased realization of facts such as these explains why it is that,

measured by the percentage of land in farms operated under lease, farm owners as a class have been losing ground.

The farm acreage operated under lease was two-fifths greater in 1925 than in 1900. During the same period the farm acreage operated by its owners decreased. Yet even in 1925 considerably more farm land was operated by its owners than was leased. But in six of the best agricultural States half or more of the land in farms in 1925 was farmed by persons who did not own it.

Land leased to farmers in 1925 was almost two-fifths of all land in farms in the 48 States. Nearly half of the crop acreage harvested was on this leased land. The figures given include acreages leased to part owners; that is, farmers who own some farm land and lease additional land. Included also are acreages operated by "croppers," who are laborers with a share interest in the crop, a class of tenants numerous in the South. The land farmed by tenants paying a share or cash rent is included.

Tenancy Increases Since 1900

Each census beginning with that taken in 1900 has shown the acreage operated by tenant farmers; that is, farmers who own none of the land in their farms. The percentage of all land in farms so operated has risen with every succeeding census; in 1900 it was 23.3 per cent; in 1910, 25.8 per cent; in 1920, 27.7 per cent; in 1925, 28.7 per cent. In 1925 tenants owning none of the land in their farms had over two-fifths, 40.6 per cent, of the entire acreage in harvested crops. The harvested crop acreage under lease was more than this by the amount under lease to part owners.

In 1900 the census showed the acreage operated by part owners. It was then 14.9 per cent of the acreage in farms. The relative importance of part-owner acreage has so risen that the corresponding percentage was 21.3 in 1925. The part owners of 1925 leased from other landowners 48.9 per cent of the acreage in their farms.

In six States, Montana, Wyoming, New Mexico, Arizona, Utah, and Nevada, part owners lease a greater acreage than tenants who own none of the land they farm.

Acreages Under Lease

Combining the acreages leased to tenants with that leased to part owners, it appears that approximately 30.6 per cent of all the acreage in farms was under lease in 1900, 33.4 per cent in 1910, approximately 36.7 per cent in 1920, and 39.1 per cent in 1925. The six States in 1925 wherein the leased acreage in farms was equal to, or greater than, the acreage operated by its owners were Illinois, Oklahoma, Kansas, Iowa, South Dakota, and North Dakota. In 10 States less than a fifth of the land was farmed by persons who did not own it. The 10 States are West Virginia, Florida, Utah, Nevada, and the six New England States. In these States agriculture is of much less importance than in the six States first named. In Maine only 4 per cent of the land in farms is under lease; in Illinois the percentage is 55.

Comparing counties, and speaking in general, a high percentage of the land is under lease in counties having the best farming land. (Fig. 117.) East-central Illinois, for example, contains a large body of very valuable farming land on which two cash crops, corn and oats,

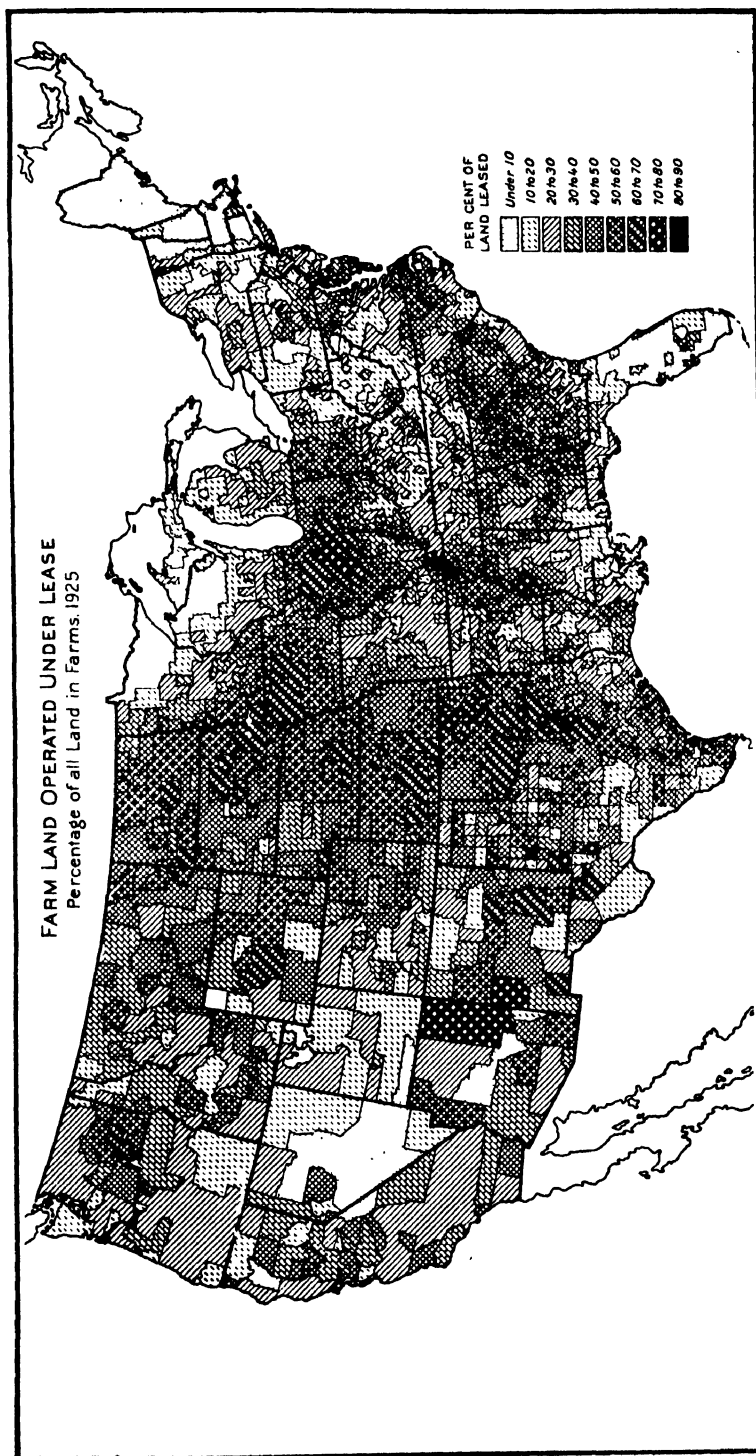


FIGURE 117.—In the Corn Belt, in wheat-growing, and in many cotton-growing counties the amount of land under lease is high. It is particularly high in central Illinois and in northwestern Iowa, where land is very valuable. Where wheat is grown, it is high in the most productive parts, eastern North Dakota, western Kansas, and southeastern Washington. Where cotton is grown, it is high on the most fertile lands, the black prairies of Texas and Oklahoma, and the delta lands north of Vicksburg. The Western States have grazing counties in which much of the land in farms is leased. Of the 2,050 counties with at least 50,000 acres of land in farms only 6 had as much as 80 per cent of the land in farms under lease, only 44 had as much as 70 per cent, and only a fourth of the counties had as much as half

have for years been the dominant crops. In the heart of this corn-and-oats country is a block of counties in which over 70 per cent of the land in farms is under lease. Surrounding counties have less valuable land and less land under lease. Land values decline toward Kentucky and Lake Superior, with the land under lease less than 10 per cent of all land in farms in certain counties.

H. A. TURNER,
*Assistant Agricultural Economist,
Bureau of Agricultural Economics.*

LIGHT-WAVE Lengths Yield Information Important to Farmer

The fact that the growth of plants constitutes a storing up of radiant energy from the sun in such a form that it becomes available for a variety of human needs has long been recognized. Within recent years very extensive studies have definitely shown that the flowering and fruiting as well as the vegetative growth of plants is greatly influenced by the relative length of day and night. In a qualitative way, two other variables of illumination have been studied, namely, the color of light and its intensity. It is common knowledge that plant stems and leaves grow differently in red light than in blue. Violet light greatly retards stem elongation, while plants grown in the longer wave lengths of the red region become elongated, weakened, and more succulent. Light intensity likewise plays an important rôle in the form and structure of leaves and other tissues. In view of this qualitative knowledge there appears to be a need for more elaborate experiments showing the quantitative relationship of light wave lengths (color) and intensity (brightness) to the various complicated processes of plant growth and metabolism, involving not only vegetative development, but also flower and seed formation.

Beyond this direct and immediately practical problem the effect of light enters into the farmer's existence in a great variety of other, and by no means unimportant, ways. It affects the health of his livestock, as well indeed as the health of his family and himself, providing an important part of protection against rickets and other diseases, including probably tuberculosis. It is required to activate the health-providing antirachitic vitamin, known as vitamin D, in order that it may have its beneficial action. It is one factor to be considered in the preparation and preservation of his commodities. The presence of light may, for instance, bring about the destruction of various essential oils which give flavor to fruits and vegetables.

Beyond the Visible Wave Lengths

Outside the region of visible wave lengths there exist light rays invisible to the eye. Beyond the red lies the region of the infra red and in the other directions beyond the blue to shorter wave lengths lies the region of the ultraviolet. While the existence of the former, largely through the heating effect it produces, which may be of therapeutic value, is recognized, the latter is often called sharply to our attention in other ways due to its particularly powerful chemical, or better, photochemical effects. It is chiefly the ultraviolet portion of the sunlight which produces sunburn. A considerable amount of ultraviolet

light invisible to the eye reaches us from the sun. It is interesting to note that the shortest wave lengths which leave the sun are absorbed in our upper atmosphere and that changing atmospheric conditions affect the amount of ultraviolet light which reaches the earth's surface. Certain wave lengths of ultraviolet light possess germicidal properties and it is for this reason that artificial sources, which yield a high intensity of light of short wave lengths, have been employed for sterilizing purposes.

From the above considerations it is evident also that harmful as well as beneficial effects may result from the action of short wave-length light and this makes even more important careful research in a field where careless procedure may lead to harm.

Finally, in a more indirect fashion, light wave lengths furnish information of value regarding the structure and behavior of molecules, of which both animate and inanimate matter is composed, and this is immediately related to the chemical changes which substances undergo under the influence of light. Further information on these subjects is of no greater importance anywhere to-day than in the fields of biology, that is to say, in the growth of plant and animal organisms. Just as the nature of a sound enables one to determine the type of instrument which gave rise to the sound, so the nature of the light, arising as it does in a fashion just as intricately dependent on the structure of the molecule as the sound is on the shape and the size of the instrument, gives us knowledge of the size, constitution, and behavior of these ultimate particles of which all matter is composed.

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O. R. WULF, *Associate Physical Chemist*,
Bureau of Chemistry and Soils.

LIVESTOCK Are Frequently Poisoned by Eating Paint and Other Forms of Lead

The Department of Agriculture frequently receives reports of lead poisoning in livestock, especially cattle. This kind of accident is not confined to any one section of the country or to any particular season of the year. In most instances the poisonous material to which the animals have had access is paint, although other forms of lead, such as red lead, sugar of lead, and litharge are poisonous and have caused death.

Paint is used very widely and most people are familiar with its poisonous nature. It is not so generally recognized, however, that livestock, especially cattle, are attracted by paint and will lick empty and discarded paint containers and even freshly painted surfaces. Carelessness in disposing of paint containers after the job of painting is done often results in giving livestock access to these objects and accidental poisoning may follow. Old paint cans, brushes, and other objects coated with paint should be discarded in places to which livestock do not have access. Animals should be kept away from freshly painted buildings, fences, and billboards until the paint is thoroughly dry. Even old paint is sometimes dangerous. There is a case on record in which cows were poisoned by licking a fence the paint on which had become old and flaky and was readily detached by the cows' tongues.

Two Forms of Poisoning—Acute and Chronic

Lead poisoning in livestock may take either of two forms, distinguished as chronic and acute. These differ mainly in the amount of lead material eaten by the animal and the symptoms subsequently exhibited by the victim. Acute poisoning, which is the more common form, follows the ingestion of relatively large quantities of lead. The symptoms are those of intense colic, grinding of the teeth, discharge of saliva, running from the nose, constipation, blindness, often convulsions, then coma and death. The breathing is more rapid than normal, the pulse is "thready," and the temperature little affected.

First-aid treatment in acute cases consists in giving a drench of Epsom salt, 4 to 8 ounces dissolved in a pint to a quart of water. Systematic treatment is technical in nature and should be given by a qualified veterinarian.

The chronic form of poisoning is less common and much more insidious. This form is produced by small and often minute quantities of lead ingested daily over a long period of time. Frequently lead poisoning is not suspected in these cases because the source of the poisonous material may not be at all obvious. Drinking water conveyed through lead pipes may dissolve enough of the metal to be poisonous. Cows have been known to be fatally poisoned by eating bullet "splashes," caused by lead bullets striking a hard object.

The symptoms of chronic lead poisoning are digestive disturbance, colic, alternated constipation and diarrhea, thirst, weakness from paralysis, emaciation, debility, stopping of rumination and lactation, sometimes convulsions, and finally coma and death. A very characteristic symptom is a blue line that appears on the gums. This is absent in acute poisoning. Treatment of chronic cases involves removal of the source of the poisonous material, doses of Epsom salt, and general supportive treatment. Potassium iodide is valuable in assisting elimination of the lead stored in the body. Here again, the treatment should be directed by a qualified veterinarian.

Cattle Are Most Susceptible

All classes of livestock are susceptible of poisoning by lead. Cattle are the most susceptible being poisoned by about one-tenth the dose required for the horse. In addition paint is especially attractive to cattle and this leads to a greater number of poisonings in cattle than in other animals. Sheep, pigs, and dogs are occasionally poisoned through lead, on the farm, but horses are rarely victims, perhaps on account of their relatively high tolerance of lead. Birds of all kinds may be poisoned with lead but under practical conditions rarely have access to lead compounds in a readily ingestible form.

JAMES F. COUCH,
Associate Chemist, Bureau of Animal Industry.

LIVESTOCK Diseases Are Studied by Experiment Station at Bethesda, Md. The control and eradication of livestock diseases are well known to be a major activity of the Bureau of Animal Industry, and much of the painstaking research necessary in solving disease problems is performed at the bureau's experiment station, at Bethesda,

Md., 5 miles north of Washington, D. C. The work is largely of pathological and veterinary character in contrast to that of other Federal stations and farms which deal with livestock and crop problems largely from a production standpoint.

Thousands of Animals Are Used in Experiments

The experiment station's activities consist of independent investigations and also cooperation with other scientific divisions of the bureau in the work necessary for combating the numerous infectious maladies which beset the country's livestock. As many as a dozen diseases may be under investigation at the station at one time. The work therefore calls for an adequate scientific staff as well as a well-trained force of attendants to care for the experimental animals. The scientific staff, of course, plans and directs the experiments and interprets the results.

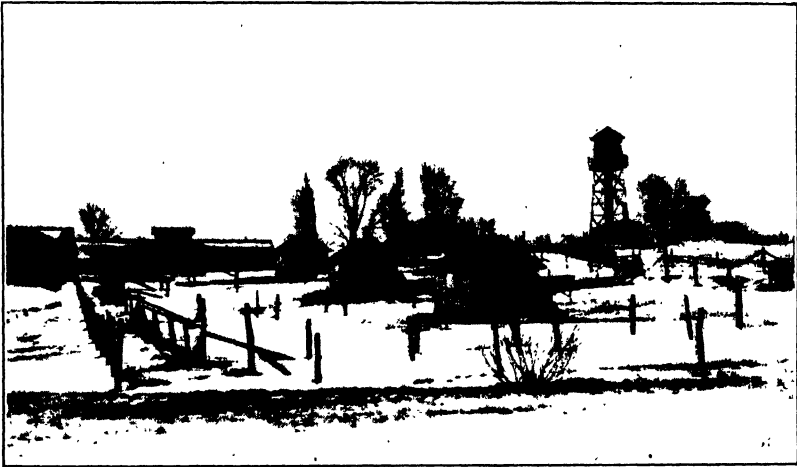


FIGURE 118.—The small stables shown in the foreground are used for experimental animals which need to be isolated from one another. The double line of fencing prevents animals in adjacent pens from coming into contact with one another.

Some of the investigations involve a complexity of problems and a number of unknown factors, so that several years must elapse before results can be accurately interpreted. In such cases long series of observations and tests are necessary, requiring the use of hundreds and even thousands of small experimental animals for inoculation purposes.

Special Equipment Needed for Investigations

The experiment station comprises 50 acres, which are used mostly for fields, pens, laboratories, and other buildings. (Fig. 118.) A small amount of land is kept under intensive cultivation to provide green feed for the experimental animals.

Some of the buildings are necessarily of a temporary nature, because new problems require rearrangement of pens, stables, and other equipment. But many are more or less permanent, such as a fireproof administration building, equipped for pathological and bacteriological work; a small laboratory used in the investigation of

poultry diseases; the superintendent's residence; a large breeding house for small experimental animals, where about 10,000 guinea pigs as well as many rabbits and white rats are raised annually; houses for small animals that are used in the experiments; a post-mortem room; and stables for large animals.

In the investigation of diseases that are easily transmitted, special arrangements are provided to prevent infection from being carried by drainage or on the feet of attendants. The pens and floors are elevated above the ground level, and basins containing disinfectants are provided through which attendants must walk on entering or leaving. Some of the structures are screened against birds. Pens containing animals affected with diseases that might be carried by insects are also screened. (Fig. 119.) Sometimes it is necessary for



FIGURE 119.—Experiment pens used for hogs, sheep, and chickens. Note the two layers of woven wire, one to restrain the animals and the other to exclude birds. The floor, made of a single slab of concrete, makes frequent disinfection relatively simple

attendants and investigators to wear rubber boots and clothing while near the infected animals, so that infection will not be carried on their persons.

The station has its own water system, consisting of two deep wells, electric and gasoline pumps, storage tanks, and pipes extending to every field and inclosure. It is provided with city gas for heating incubators

and for other laboratory uses, and with electric current for power and lighting. An incinerator disposes of animal carcasses and other infectious material.

Some Outstanding Results of Station Work

The work at the station played an important part in the epoch-making discovery by Theobald Smith of the cause of tick fever. The station helped also in making tick eradication possible, in working out the relation of human to bovine tuberculosis, and in the earlier hog-cholera investigations.

Several times the station has aided in the determination of foot-and-mouth disease outbreaks. It has also made important discoveries in connection with a disease which so nearly resembles foot-and-mouth disease in appearance as to be a very confusing factor in its diagnosis. Its investigations of infectious abortion, which have been conducted for about 20 years, have led to the discovery of fundamental facts concerning the nature of that disease and its control.

For a third of a century the station was under the direction of the late Ernest C. Schroeder, who was superintendent from 1894 until his death in 1928. During that period the work of the station developed to a high state of efficiency and gained world-wide recognition.

Persons interested in animal diseases, especially those who have to deal with the particular diseases under investigation, can often gain

helpful information by a visit to the station. However, since many of the experimental animals are kept under what amounts to quarantine conditions, arrangements must be made so that such persons are accompanied by an employee familiar with the various experiments.

W. E. COTTON,
Superintendent.

J. M. BUCK,
Assistant Superintendent,
Bureau of Animal Industry Experiment Station.

LIVESTOCK Grades and Meat Grades Are Now Closely Correlated

A meat animal possesses no points of excellence which are not inherent in the carcass and which can not be appraised by the meat dealer or meat consumer. The animal is bred, fed, raised, and slaughtered to produce something the meat consumer wants and for which he will pay a good price.



FIGURE 120. -Choice grade slaughter steer and Choice grade steer carcass

Hence, there must be a very close relationship between grades for livestock and grades for meat; in fact, the grade of the animal must be the same as that of its carcass. The standard for a given grade, therefore, must be the same whether the animal is graded alive or dead, on the hoof or on the hooks.

Until recently, however, both the livestock and the meat industries largely ignored this important fact. Livestock producers set up certain standards or ideals which embodied their own preferences or which they considered best suited to their economic circumstances, without giving much consideration to the meat industry because the latter always bought at some price all the livestock produced. If the price was unsatisfactory to the producer he usually charged that fact up either to his hard luck or to the greed of the buyer. Even at the great livestock shows the animals were judged by comparing one with another instead of matching the animals with the carcasses they would produce and matching those carcasses with consumer demands.

The meat industry exercised a similar independence. The consumer demanded the kinds, classes, weights, and grades of meat which best suited his taste or pocketbook and insisted that the stockman either supply that kind or accept a lowered and unprofitable price.

Then came lean years, years made up of high production costs and low selling prices, and the stockman was forced to cast about for the basic causes of his distress—and for any possible remedies. About this time the Department of Agriculture began to develop its livestock and meat standardization program. One of the fundamental principles of this program was the proposition that in slaughter animals the grade standards must be the same for the live animal and for its carcass. Once enunciated, this principle was readily accepted by the more forward-looking members of both the livestock and meat industries, with the result that a relatively high degree of cooperation between the activities of the two is now in evidence.

Standards Based on Three Factors

Live animal grading is nothing more nor less than an antemortem grading of a carcass. The standards used by the department, whether for live animals or for dressed meat carcasses, are based upon three factors—conformation, finish, and quality. To grade Choice, a light-weight yearling steer must possess certain conformation. In other words, the round, the loin, the shoulders, and all other portions of the animal's anatomy must be developed in a certain way or to a certain degree. It must also possess a certain degree of finish, that is, the fat must be of a certain thickness on different parts of the body and must be of a certain character. Then the animal must possess a certain degree of quality.

When the carcass is graded the same requirements must be met. If the carcass is to be graded Choice the conformation, the finish and the quality must be the same as required in the live animal. As a matter of fact, the standards set up for the live animal were really carcass standards, because it was the carcass at which the work was aimed from the beginning. When considered from this viewpoint it is obvious that the live animal grading was merely an effort to look under the skin and visualize the carcass while the animal was still alive.

There still remains the problem of maintaining this identity of standards in actual practice—to guarantee that an animal which grades Choice on foot will produce a Choice grade carcass on the hooks. This is the stumbling block which, to many, seems insurmountable.

On the great livestock markets hundreds of men are paid good salaries solely because of their skill and ability in determining in advance what is under the hide of a meat animal. Department workers are constantly grading both live animals and meat carcasses, and the record of their performances shows conclusively that it is wholly practicable to require a definite correspondence between the grade of the animal and its carcass.

Recently the department has cooperated with 21 State experiment stations in a study⁹ involving the grading of more than 2,000 cattle

⁹The national cooperative project, *A Study of the Factors Which Influence the Quality and Palatability of Meat*. This study was conducted by the Bureau of Agricultural Economics, Animal Industry, and Home Economics of the United States Department of Agriculture and the experiment stations in the following States: Arkansas, Colorado, Indiana, Illinois, Iowa, Kansas, Louisiana, Michigan, Mississippi, Missouri, Montana, Nebraska, New Mexico, North Carolina, Ohio, South Carolina, Texas, Virginia, West Virginia, Wisconsin and Wyoming.

and their carcasses. Although the department's official standards provide for only seven grades, in this study each grade was divided into three thirds, which called for much greater refinement in the grading. It was found that over one-third of the 2,000 carcasses were placed in the same third of a grade as had been the live animals from which the respective carcasses were derived. In approximately one-half of them the difference between live and dressed grading was only one-third of a grade, and in about 15 per cent it was two-thirds of a grade. In other words, approximately 96 per cent of the carcasses were placed within the same grade as had been the live animals which produced them. Those who graded the carcasses had no knowledge as to what grade had been placed on the animal. Thus a very high degree of correlation between the application of livestock grade standards and meat grade standards was demonstrated.

C. E. GIBBONS,
Senior Marketing Specialist.

L. B. BURK,
*Agricultural Economist,
Bureau of Agricultural Economics.*

LIVESTOCK Malady Known Public discussions of abortion disease continue to show that livestock owners regard it as the arch enemy of domestic animals in the United States. Its ravages, especially among cattle, have become conspicuous in recent years by reason of the gradual suppression of tuberculosis and other diseases for which effective eradication and control methods are already known.

As reported in the Yearbook of Agriculture, 1928, the Department of Agriculture is endeavoring to find improved means of suppressing infectious abortion through a comprehensive program of laboratory research and experimentation on farms. Eight State universities or experiment stations are now cooperating in this work. The studies are highly technical, yet it is desirable for stock owners to be familiar with the broad scope and nature of the work and with the encouraging progress made during the last year.

Scope of Cooperative Work

The investigations in which State institutions are cooperating include the following subjects:

California. The veterinary department is studying the problem of immunity, carriers of the disease, and the relative productivity of infected and noninfected dairy cows on the same farms. The animal-husbandry department is conducting a project on nutritional deficiencies and abortion in beef cattle on the range.

Maryland. The abortion project comprises (1) a herd survey of reacting animals to determine the relation between the reactions to the abortion test and udder infection, and (2) determining the best methods of limiting infection and reducing exposure in infected herds when more drastic means of control are not practicable.

Michigan. The work in this State includes (1) the use of abortion germs, freed of virulent properties, as an immunizing agent, and (2) bacteriological studies of the organism.

Minnesota. The project here deals with the standardization of blood tests in combating the disease.

New York. The work in this State deals with eliminating abortion by blood testing and segregation of reactors.

Oregon. The project here includes (1) studies of cattle that have given certain types of reactions to agglutination tests, and (2) the effect of reinfections among cows that reacted to the disease.

Wisconsin. In this State the study involves (1) the use of chemical agents as a possible means of dealing with the disease, and (2) breeding experiments with rabbits resistant to abortion.

Independent Federal Investigations

In addition to cooperating in the work just outlined, the United States Department of Agriculture is conducting independent investigations. This work deals, in a general way, with artificial immunization, methods of diagnosis and their interpretation, various methods of control and eradication, modes of infection, and relation of swine and bovine abortion. One endeavor is to develop a vaccine that will be effective and at the same time not become established in the udder. The discovery that the abortion organism has a human-health significance makes it more than ever desirable that methods of vaccination do not cause udder infection. This work involves the use of large numbers of experimental animals, frequent blood and milk tests, controlling exposure to the disease, and innumerable details, all of which are time consuming.

The presence of the swine type of abortion organism in the udders of cows is likewise under investigation owing to the belief that this type of organism is more infectious for man than the bovine type usually found in cattle.

Calfhood Vaccination Is Promising

Investigations as to the possibilities of vaccination during calfhood are yielding results of interest, though they are not yet conclusive. Of 11 vaccinated animals, 10 have successfully passed through two periods of pregnancy during each of which they received exposure to infection of such severity that 50 per cent of the control animals aborted. The results thus far indicate that calves may be vaccinated with relatively little danger of becoming permanently infected.

Another group of calves has been vaccinated at a somewhat earlier age. This system, if successful, would have the advantage that even if the vaccine infected permanently an occasional animal, it could be detected before reaching breeding age.

Owing to the great importance of diagnosing infectious abortion accurately, the department's investigators have made many thousands of blood tests on animals over which it has control in its own herds and in others under observation. This work has resulted in voluminous data on the accuracy and also the limitations of the agglutination test and its interpretation.

Other data recently obtained have indicated that the introduction of the organism into the skin infects more readily than when introduced under it. This feature is being investigated to determine whether slight scratches or injuries to the skin may be a means by which the disease can be communicated.

Even though some of the experiments may fail to bear the fruit hoped for, every fact that can be revealed is a step of progress. Pending the results of the experimental work outlined, livestock owners may aid in keeping losses from infectious abortion at a minimum by utilizing the knowledge already available. Various practical methods of excluding infection from herds and premises and of dealing with the disease, when already present, are discussed in Farmers' Bulletin 1536-F, which may be obtained on request.

Consult Dependable Sources for Information

Livestock owners are cautioned against placing dependence on alluring claims for medicinal cures or remedies for abortion. Money spent for such products is likely to be wasted, not to mention possible injury that may be done to livestock. It is also unwise to draw general conclusions from limited observations on a few aborting animals. Studies of the disease, to justify sound conclusions, must be made under carefully controlled conditions with ample numbers of livestock. The wise and safe course in dealing with infectious abortion is to consult a competent, trained veterinarian or to request the latest publications and other information from State agricultural experiment stations or the Department of Agriculture.

J. R. MOHLER,

Chief, Bureau of Animal Industry.

LIVESTOCK Production Estimating by States is Complicated Task

For many years the Division of Crop and Livestock Estimates has issued annual estimates of the amount and value of crop production, by States, but only during the last three years have similar State estimates been undertaken for the principal meat animals—cattle, hogs, and sheep.

Because of the marked difference in the methods of production between livestock and crops, estimating the amount of livestock production each year by States is a much more complicated procedure than estimating the amount of crop production. Crops are largely raised in definite yearly quantities, determined by multiplying the estimated acreage by the estimated yield per acre, and production is in terms of fairly uniform units, as bushels, bales, or tons. Crops are produced entirely within the locality in which the acreage is located.

Livestock production is not in definite yearly amounts but results from the addition to numbers due to births and increase in weight due to growth of young animals toward maturity. Only a fraction of the animals born reach maturity, since many are disposed of at different ages and different sizes, with no uniformity either in these ages or sizes or in the proportions disposed of from year to year. Livestock production is not completed within the locality in which the animals are born, for there is an extensive movement of unfinished animals out of some States into others to be grown out or finished. The weight added to these animals is considered as livestock production.

In the methods worked out for determining the yearly amount of livestock production by States there are three distinct operations. The first is concerned with inventories. The number of each species, as estimated at the beginning and end of each year, is separated into

different significant age and sex groups. The average weight per head of each of these groups is estimated, and the sum of the total weight of each group gives the total inventory weights at the beginning and end of the year. The difference between these total weights is the difference in inventory. Although differences in feed supplies, weather conditions and other factors from year to year result in differences in average weights of different classes of each species at the end of each year, such differences are not included in the estimated average weights per head of different classes—these averages are taken as constant from year to year.

Determining Increase or Decrease

The next operation is to determine the items of increase and decrease responsible for the changes in inventory numbers during the year. This is shown in the form of State balance sheets which give for each species, on the debit side, the number on hand at the beginning of year, number of young animals born (or saved), and number shipped into the State. On the credit side are shown the number shipped to markets, the number sold locally for slaughter, the number slaughtered on farms, and the number that died. The sum of the credits, subtracted from the sum of the debits, gives the number at the end of the year.

The third operation is to convert the items in these balance sheets that are factors in determining the amount of production, into pounds, by multiplying the number of head by an estimated average weight per head. These total weights are then combined to arrive at the total production. The method of combining these is as follows: The total weight of animals shipped, sold for local slaughter, and slaughtered on farms, which gives the amount disposed of during the year, is obtained; from this total is subtracted the total weight of animals shipped into the State during the year; this difference is then either increased or decreased by the change in inventory weights according as the inventory increased or decreased. This final amount is the total production in pounds.

This total production is evaluated by multiplying the weight produced by the weighted average farm price per pound. This weighted farm price is obtained by weighting the monthly farm prices by each month's proportion of the total yearly marketings. The inventories at the beginning and end of the year are not evaluated; hence changes in inventory values due to change in unit values are not included in value of production. The animals shipped into the State are not evaluated at an average cost; only the increase in weight of these is evaluated, not separately, but as a part of the total production. Animals that die are not considered as animals produced. In the production figures no consideration is given to young animals that die within the year in which they were born; animals that were in the beginning-of-the-year inventory, and that die during the year, are included in the previous year's production but are deducted from that of the following year. The inclusion and deduction, however, are made in the balance sheets and not in the actual production figures.

Methods Different for Cattle, Hogs, and Sheep

Among the three principal kinds of livestock there is some difference in methods. Because of the big difference both in weight and price be-

tween cattle and calves, and the large number of calves slaughtered in the year when born, the weights and values of calves disposed of are computed separately from those of cattle. The separation between sheep and lambs is carried further. Large numbers of lambs born in one year are put on feed for market and carried into the following year, and are sold for slaughter, as lambs, in that year. Hence, it is desirable to make separate estimates of the amount and value of production of sheep and of lambs, taking into consideration changes in the inventory of lambs in computing the lamb figures. Because of the comparatively narrow price range on hogs of all ages, it is not necessary to separate pigs from other hogs.

Prices used in these estimates come from price reporters who give the average price paid in their localities. These are largely prices paid for animals for slaughter or for shipment to markets; hence they are values for meat purposes. They do not include value for other purposes, such as the milking value of dairy cattle or the breeding value of purebred livestock of all species. Hence these estimates are to be considered as representing largely the amount of livestock produced in pounds and the value of this production at meat-animal prices.

Information used in preparing these estimates is obtained from various sources. For many States rather complete information is available showing shipments to market or out of the State, and into the State; farm slaughter is estimated from census and sample data; information as to local slaughter is inadequate and these figures are largely estimates; average weights are based upon sample data, market records, census slaughter reports, and informed opinions; numbers of young animals born (or saved) and death losses are estimated from reports from a large number of farms and ranches giving these items for their own production and from farm and ranch management surveys.

Because of the lack of definite information as to some of the factors used in making these estimates and the great difficulty (amounting almost to impossibility) of getting fairly exact information as to some of them, these estimates are only approximations. Hence they can be considered as being more exact in showing relative changes in the amounts and value of production from year to year, than in giving absolute figures for any year.

C. L. HARLAN,
*Senior Agricultural Statistician,
Bureau of Agricultural Economics.*

LIVESTOCK Profits Grow Almost daily, county agricultural
Following Adoption of agents are asked how to increase live-
County Agents' Counsel stock profits. Their practical sug-
gestions for more profitable livestock
management have included better breeding to improve quality of live-
stock, more intelligent and economical feeding, the control or elimina-
tion of livestock diseases, and proper fitting and grading to meet the
market demands and obtain the highest prices for the product.

A herd-improvement association member in Stephenson County, Ill., who adopted recommendations for a change from ear corn as the only grain feed to a balanced ration increased his net returns on the herd above feed cost from \$112 one month to \$181 the following month. A

member in another Illinois herd-improvement association after weeding out half of his herd as unprofitable and feeding the remaining cows better rations increased the returns per dollar spent for feed from \$1.61 to \$2 and reduced the cost of producing butterfat from 40 cents to 24 cents per pound.

Culling out the poor producers and introducing selected purebred sires have increased the average production of daughters over dams in many herds as much as 100 pounds of butterfat. The influence of the improvement in the productiveness of cows has been exceptionally large in Minnesota. The census reports show that during the five years from 1920 to 1924 there was an increase in milk production in the State of 40 per cent with only a 12 per cent increase in the number of cows.

Dairy Herd Feeding Costs Reduced

Reports of 1,320 dairy-herd-improvement associations which are maintained in counties with the assistance of county agricultural agents indicate that the cost of feeding dairy cows has been reduced in many herds as much as 10 cents a cow per day with no decrease in milk production. Doubling the carrying capacity of pastures through the use of sweetclover has materially reduced the outlay for commercial feeds. One farmer near Plum City, Wis., reported that a 20-acre pasture of sweetclover took care of 35 head of cattle, 35 hogs, and 5 horses from May 20 to September 1.

The average yearly butterfat production in more than 2,000 herds in Iowa cooperating in dairy-herd-improvement work was 275 pounds, while the average for the State was only 175 pounds per cow. The average feed cost per pound of butterfat was 22 cents in cooperating herds compared with 38 cents per pound for the whole State. Improved management has doubled and even quadrupled the average profit per cow in many herds where farmers have adopted better methods in dairying.

The quality of dairy products has been improved through increased sanitation and better methods of handling milk before it reaches the creamery, the cheese factory, or the shipping station. This improvement in quality has helped to increase the demand for dairy products, and increased consumption has helped to maintain prices. Tuberculin testing of dairy cows has been encouraged. This has resulted in eliminating from the dairy herds of this country on the average more than 250,000 reacting dairy cows a year during the past five years. Nearly 100,000 additional cows were culled out each year through the records of the herd-improvement associations. Both of these methods of culling have reduced production costs.

County agents have also been active in getting all farmers in their counties to have their cows tuberculin tested in order to place the counties on an accredited-area basis. The 10 cents per 100 pounds premium paid by packers for hogs from accredited areas has increased returns to farmers by more than \$10,000 in a single county. This premium money returned to the hog raisers in accredited areas in the United States is more than \$600,000 annually.

Hog Losses and Production Costs Reduced

In swine production, the sanitation and other improved practices recommended have in many instances reduced the time necessary to

produce a 220-pound hog from 9 or 10 months to 6 or 7 months. Adoption of sanitation methods has also materially reduced the losses of pigs from disease. The average feed and labor cost for the litter is therefore greatly reduced and the net profits are increased accordingly.

Reports from 39 county agricultural agents of Illinois showed that the average number of runty pigs was reduced from 1 in 8 under the old plan of raising hogs to 1 in 86 under sanitary methods. The 314 cooperating farmers reported an average saving of \$16.20 per litter in the cost of producing pork.

On one farm in Green Lake County, Wis., where sanitary methods were not followed in 1926, 9 sows farrowed 60 pigs, 4 of which were lost due to roundworms.

The remaining 56 averaged only 180 pounds at 11 months of age. In 1928 on the same farm under sanitary conditions, 8 sows farrowed 62 pigs; no losses occurred during the growing period; and the 62 pigs averaged 212 pounds each at 6 months of age.

Iowa county agents reported 34,000 hogs raised in hog-lot sanitation demonstrations carried on in cooperation with the county agricultural agents during 1928.



FIGURE 121.—These two hogs are the same age. The large hog at left was raised on clean ground while the runt at right lived on the worm-infested old hog lot and never grew up.

More Wool per Fleece and a Better Price

Better methods in shearing, grading, tying, and sacking wool often result in an increase in its market value of 5 or 10 cents per pound in comparison with wool improperly handled and prepared for market. Many extension agents reported that culling ewes and using selected rams has increased the average weight of fleece 2 pounds per head in some flocks.

The county agent in Lake County, Oreg., reported a sheep-culling demonstration which has extended over a period of six years. Light-shearing ewes were culled out at shearing time and heavy-shearing rams were used, with a resulting increase in average fleece weight of 1.5 pounds during the first five years.

More Eggs and Profits from One-Fourth Less Hens

Many poultry cooperators who have adopted the sanitation, culling, feeding, and management practices recommended have been able to double both the egg production and profits received by average farmers.

One-fourth of the flock has frequently been culled out as poor layers without reducing the total number of eggs gathered daily. This has resulted in a considerable saving in feed. Reports from 264 Illinois poultry record flock cooperators showed that the one-third who received the best returns obtained an average profit per hen of \$2.85,

while the least successful one-third of the record flock cooperators made only 16 cents per hen. The improved breeding, feeding, sanitation, and management methods in the flocks of the more successful cooperators made the difference.

Early Gains Make Largest Profit

County agents and extension specialists have continued to acquaint livestock producers with the fact that early gains in weight of livestock, including poultry, are put on at the lowest cost and usually at the largest net returns to producers for feed and labor expended.

Twenty-two Indiana farmers, cooperating in calf-raising demonstrations in which accurate accounts were kept of costs, raised 105 beef calves from 113 cows.



FIGURE 122. -The scrub ewe at left has scanty fleece and bare spots. Her lamb at right by purebred ram has no bare spots. The wool clip of the ewe was 3 pounds and of the lamb 8 pounds

These calves, which were conservatively appraised at \$48.59 each, were produced at an average cost for feed of \$29.16. The cost of feed per pound of gain for 2 year old and 3 year old steers is 25 to 50 per cent more than for calves and yearlings. Lower feed costs and improved quality and price of baby beef has increased the number of cattle marketed in this form. Cheaper gains have also been produced both in hogs and beef cattle by finishing with some protein concentrate to speed up gains and shorten the feeding period. One Illinois farmer reported that the improved system of feeding a balanced ration to his hogs

made \$800 more for him than he could have made with his former methods from the same number of pigs farrowed.

Improved Products Bring Better Prices

In addition to direct increased returns reported by farmers through membership in livestock-shipping associations there has been a material increase in prices received due to members producing more nearly what the market demands. One sheep management demonstration in Missouri showed that the use of a purebred ram increased the price received for lambs \$2.56 per head in comparison with the price received for lambs sired by a grade ram used on the same flock. This made a difference of \$105 on the 41 lambs.

A North Dakota agent reported the pooling and selling cooperatively of practically a quarter of a million pounds of wool by about 200 growers. The pool price received was 4 cents per pound higher

than the prevailing price at the time of sale and 6 to 10 cents higher than the prevailing price at the time of delivery.

Among the later developments in the cooperative marketing of poultry has been the formation of turkey cooperative-marketing associations. Oregon reported one of these organizations with 280 growers producing 41,000 turkeys. One of these turkey raisers reported that selling through the organization resulted in an increase in price of at least 5 cents per pound. This meant an increased return of approximately \$7,000 to the turkey growers of central Oregon.

These are a few instances of how farmers have increased their profits by the adoption of improved practices and management of a farm enterprise as recommended by county agricultural agents and the State extension service. On many farms the increased profit for one year on one enterprise was more than equal to the taxes on the farm or enough to put a modern water system in the home, buy important equipment for the farm, or pay a year's expenses of a son or daughter at college.

H. W. GILBERTSON,
Senior Agriculturist, Extension Service.

LIVESTOCK Tuberculosis Eradication Aided by Post-mortem Findings

Ever since the beginning of the systematic plan, now in effect, for the eradication of tuberculosis among livestock, the importance of post-mortem findings has been appreciated by those engaged in the work. Fortunately, there exists a reliable diagnostic agent, the tuberculin test, for use on the living animal. Without such a test the task of controlling and eradicating the disease would probably be impossible. Post-mortem examinations of the animals slaughtered also are valuable in showing to what extent tuberculosis has progressed in animals. This information serves in many ways to aid in the progress of the campaign for eradicating the disease.

Diseased Carcasses Are Impressive Evidence

Owners of tuberculous cattle, and other interested persons, have had opportunity to obtain first-hand information on the progress of this insidious disease in their herds by observing post-mortem examinations made by trained veterinarians at federally inspected abattoirs and elsewhere. The cattle owner unfortunate enough to have tuberculosis in his herd is usually convinced of the seriousness of this disease when he sees the tuberculous lesions revealed by autopsy. These demonstrations have been helpful in bringing about a better understanding of the campaign for the eradication of tuberculosis.

In the beginning of the work many field post-mortems were made when the campaign was to be taken up on a county-wide basis, or under what is known as the area plan. On those occasions a large number of people would gather to witness the autopsies conducted by skilled veterinarians. Fresh specimens showing the lesions were often placed on trays before the spectators.

In connection with the control and eradication of tuberculosis of swine and poultry, similar post-mortem examinations have proved to be highly educational. This is especially true in the case of poultry when autopsies can conveniently be made on the farm in the presence of

persons who take care of the poultry. These demonstrations have been useful in the eradication of poultry tuberculosis.

Tracing and Locating Centers of Infection

The efforts expended in connection with post-mortem examinations of tuberculous livestock would be fully warranted if their value were limited only to education, but there is still another feature of great importance to the campaign—the tracing of tuberculous infection to its source.

For many years the meat-inspection service of the department has used a form for reporting post-mortem evidences of tuberculosis and other infectious diseases found on autopsy of animals slaughtered under official inspection. It is often difficult and sometimes impossible to learn the origin of infected animals, but when this can be done very satisfactory results are obtained, especially in the case of tuberculosis of cattle and swine. Two typical cases may be cited.

In a carload of hogs, slaughtered in an officially inspected establishment on the Atlantic seaboard, more than half the animals were affected with tuberculosis. They had been purchased through a commission firm at a livestock market in the central West. The firm furnished information showing that the hogs originated on a certain farm in an adjoining State. An investigation disclosed that tuberculosis had existed among cattle formerly on the farm and steps were immediately taken to clean and disinfect the premises where they had been kept.

In another instance a large percentage of a small shipment of hogs received at a federally inspected packing house in the central West was found to be extensively infected with tuberculosis. An investigation indicated that the farmer who fattened the hogs purchased them from another farmer who had given to the young pigs the carcass of a cow that had probably died of tuberculosis.

Tattoo Marks Aid Identification

In the last few years the practice of tattooing hogs so that the identification marks can be seen on the dressed carcass has been followed extensively. This practice is largely encouraged by the fact that some packers have voluntarily paid a premium of 10 cents per hundred-weight for hogs that originated in so-called modified accredited counties, signifying areas in which tuberculosis among cattle has been reduced to not more than 0.5 of 1 per cent. When tattoo marks are found on tuberculous hogs it is comparatively easy to trace their origin, since the tattoo codes are known to those in charge of the work.

Still other features of the program for eradicating tuberculosis largely depend on post-mortem reports. For example, in parts of the country where tuberculosis among livestock has been reduced to a minimum, careful post-mortem examinations are a reliable check on the condition of the animals within that area. Local practicing veterinarians can be of much assistance by reporting the results of autopsies made. Reports indicate that the numbers of tuberculous cattle and swine, found as a result of post-mortem examinations under Federal supervision, have been decreasing since the campaign has been well under way.

A. E. WIGHT,

Principal Veterinarian, Bureau of Animal Industry.

LUMBER for Farm Buildings Should be Well Seasoned

Putting up farm buildings with lumber that is not dry enough results in a variety of structural troubles and defects. These include cracks in floors, plastering, and walls; rattling windows and loose-fitting doors; sagging and distorted walls; leaks around doors and windows; weakened structure caused by reduced nail-holding power; blistered paint; increased liability to decay, particularly near the ground line and in places where the wood dries out slowly; warped, checked, and cupped boards; and general distortion of the entire building.

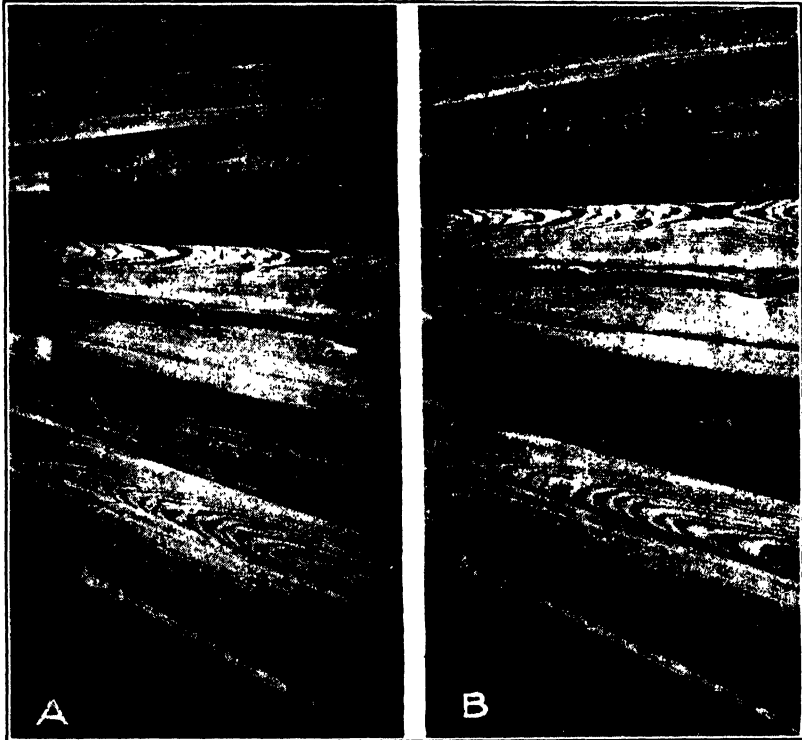


FIGURE 123.—A test panel made of green lumber (A) at the time of construction and (B) one month later. Note the cracks between the boards caused by the shrinkage of the lumber as it dried

Only thoroughly dry lumber should be used in frame constructions. This is because so much water is contained in green lumber that it will cause trouble by shrinking as it dries; and, in confined spaces, it may dry so slowly that it will decay before it becomes thoroughly dry.

The process of drying lumber is usually known as seasoning. In the seasoning process lumber loses most of the water that it contained in the living tree and shrinkage takes place in the wood. A 12-inch board of fir or pine may shrink as much as half an inch in width in seasoning. (Fig. 123.) Obviously this shrinkage should take place before the board is put into use.

Seasoning also causes an increase in the strength of lumber. A piece of wood is made up of thousands of microscopic wood cells, which, like the visible cells in a piece of bread, when full of moisture make the

piece soft and flexible and when dry make it hard and rigid. Furthermore, seasoned lumber is free from the attack of the fungi which produce decay or rot. Seasoned lumber also can be glued and painted satisfactorily, whereas green lumber can not.

Seasoned Lumber Should be Kept Dry

No matter how carefully lumber may have been seasoned, it must be kept dry, both at the lumber yard and on the job, lest it reabsorb large quantities of moisture from the air before being put to use. A common abuse of dry lumber, particularly that intended for exterior and interior house construction, is to leave it lying around unprotected until the time comes to use it. Dry lumber is often stored in a damp basement during the erection of the upper stories of the house, or, in the case of interior woodwork, is put up before the plaster has dried. All such practices are sure to lead to unsatisfactory service.

Wood intended for use in barns, hog houses, sheds, and similar structures need not be so dry as wood intended for the interior of houses, particularly in the Northern States. Once satisfactorily dried for interior use, such lumber may be bulk-piled in a dry unheated shed where it will then remain in satisfactory condition for an indefinite period.

Wood intended for use in the interior of heated houses should be stored in a drier place than an ordinary shed. If it can be stored in a house under conditions similar to those to which the wood is to be subjected in use, that will be satisfactory. Lacking this storage space, a warm, dry attic will make a satisfactory substitute.

Exterior window and door frames are often subjected to severe weather conditions during the course of erection, so that the usual priming coat is ordinarily not sufficient protection. Special effort should therefore be made to keep the frames out of the rain before and during erection and to protect them by paint at the earliest opportunity.

ROLF THELEN,
Senior Engineer, Forest Service.

MADAGASCAR Expedition Finds Rubber Plants Possibly Suited to U. S. Although the island of Madagascar, lying in the Indian Ocean south of the Equator, is larger than France and possesses a rich tropical and subtropical flora, it had apparently never been visited by an American botanist prior to the writer's trip there in 1928 in company with Prof. Henri Humbert, of The University of Algiers. This expedition was sponsored by the University of Algiers, the Arnold Arboretum of Harvard University, and the United States Department of Agriculture, and had as its objective the collection of all the herbarium material possible from Madagascar, as well as living material of plants likely to prove of value to Algerian or American agriculture.

The expedition spent several weeks in the extreme southwestern part of Madagascar, where tree Euphorbias and many other vigorous plants flourish (fig. 124), notwithstanding the very pronounced aridity of the region. The annual rainfall here is frequently much below 10 inches, droughts lasting six months occur every year, and sometimes no rain falls for periods as long as six years. The plants that can withstand

such extreme conditions must either be able to store large quantities of water, or make efficient use of the dew.

Travel in such a dry region is extremely difficult. On one occasion six members of the expedition, including the writer, collapsed because of lack of water. Since the French occupation of the island in 1896 many automobile roads have been built; and though some roads now reach into southern Madagascar, much of the time the expedition was forced to travel by "filanzana"; that is, carried in a sort of sedan chair on the shoulders of four natives.

Throughout all Madagascar, and especially in the little-known southern part of the island, are found many plants that have some potential value for American agriculture. Chief among the numerous ornamentals are the Kalanchoes. With their striking beauty in flower and foliage there is combined a remarkable ease of propagation, and these succulent plants will undoubtedly prove to be useful additions to American horticulture, especially in the Southern States. Living material of 12 species of Kalanchoe were brought to Washington by the writer, and extremely satisfactory results in propagating them have been obtained.



FIGURE 124.—View in the *Euphorbia* forest of southern Madagascar: *Euphorbia entecrophora*, the tall tree in the center

Rubber Producing Plants Obtained

Madagascar possesses a large number of plants that have been used commercially for rubber, and many others that have possibilities of exploitation. The expedition returned to Washington with 23 lots of potential rubber-producing plants, including 10 species which have actually been commercially utilized. Most of these plants are now being satisfactorily propagated for future trial in the United States.

Perhaps the most interesting material collected by the expedition consisted of live specimens of *Euphorbia intisy*, an almost extinct species of rubber-yielding plant. This plant, which is almost leafless, is able to withstand the extremely arid conditions characteristic of southern Madagascar by having a water-storing root system of unique type. Twenty-five years ago—long before order had been established in southern Madagascar—the rubber from this plant was highly prized in France for making automobile tires, and at the height of its commercial exploitation it commanded a price in excess of \$1.20 a pound—a high price at that time. But the high value of this rubber spelled the doom of the species as a commercial one, for the time, for the natives collected the rubber so ruthlessly that even botanists well acquainted with Madagascar feared the species had become entirely extinct. The expedition located some of these plants and brought living specimens back to Washington.

Propagations of the original intisy plants are now being obtained, and material for testing has been sent to California, Arizona, and Florida. It is hoped that localities will be found in these States where this valuable rubber plant will thrive—perhaps on a plantation basis, perhaps as a waste-land crop, growing slowly but surely, without attention on land now considered entirely worthless for agricultural purposes.

It will be many years before sufficient material has been propagated and the true worth of this plant established through field trials. Nevertheless it should be emphasized that many present-day American industries are based upon the introduction of but a small amount of plant material, such as in this case. Viewed in that light, progress with *Euphorbia intisy* has been very satisfactory.

CHARLES F. SWINGLE,
Assistant Pomologist, Bureau of Plant Industry.

MAYONNAISE Produced Commercially Since 1906 for Growing Trade Mayonnaise, like many other foods of commercial importance, originated as a home product. Housewives and other purveyors of foods endeavoring to prepare a salad dressing of desirable quality early took advantage of the fact that a combination of egg and a vegetable oil in proper proportion would, when rapidly stirred or beaten, produce a desirable emulsion. It was also found that such an emulsion with the addition of certain condiments and spices, would be semisolid, fairly stable, and palatable.

It was only natural that this product, which had gained popularity in so many homes, should become an object of commercial enterprise. Mayonnaise was first made commercially in the United States in 1906. Its growth as a commercial product has been rapid and constant, and to-day it is manufactured in practically all our large centers of population. Statistics show that in 1928 more than 7,000,000 gallons of mayonnaise were made, with a value of over \$16,500,000.

By making possible the purchase of mayonnaise in convenient and attractive form in practically every community in this country, commercial manufacture has done much to increase the popularity of this food product. Commercial production has also brought about a fair degree of uniformity in the composition of mayonnaise and methods of its manufacture, whereas under household conditions there has always been the greatest diversity in the methods used.

Mayonnaise is an emulsion of the oil-in-water type in which, by agitation, the oil has been separated into globules of microscopic size. Each globule becomes coated with a thin film of the emulsifying agent, egg yolk, and thereby is prevented from coalescing with the other globules, at least for a time.

Between and around the globules flows the fluid which constitutes the liquid phase of the emulsion. For a proper conception of the requirements of this product it should be understood that with the exception of the egg and oil all its constituents exist either in solution or suspension in the liquid phase.

Constituents of Mayonnaise

Only an edible vegetable oil can be used for making mayonnaise. Cottonseed, corn, and sesame oils are the ones largely used for this

purpose, particularly the two first mentioned. Whatever oil is used must be pure, clear, and free from rancidity. Oil from cottonseed is a bland oil well suited to this purpose, but owing to a tendency to separation of the stearates it will often congeal at low temperatures. Corn oil does not congeal at low temperatures, but objections are sometimes made to it because of its flavor or color. For these reasons many manufacturers use corn oil in the winter and cottonseed oil in the summer.

Manufacturers differ regarding the proportion of oil to be used in mayonnaise, the range being from 50 to 80 per cent. The more common range is from 60 to 75 per cent. In the standard for mayonnaise adopted by the United States Department of Agriculture. The minimum for oil is 50 per cent and the minimum for the combined oil and egg content is 78 per cent of the entire product.

Egg in some form is used by all manufacturers of mayonnaise as the emulsifying agent. The concensus of opinion, based on ample experience, is that the use of egg yolk affords the best chance for securing the desired quality and stability of this product. The above-mentioned standard for mayonnaise recognizes only the use of egg yolk or whole egg. The egg yolk used may be either fresh or frozen. The latter has the advantage of being more convenient and seems to give results fully equal to those with fresh yolks. The possibility of its being highly contaminated with spoilage organisms must, however, always be taken into consideration.

Manufacturers Differ as to Egg Proportion

In regard to the proper proportion of egg to use, as in regard to the oil, manufacturers differ. It ranges from 6 to 20 per cent. More commonly, however, the range is from 8 to 12 per cent.

Vinegar or lemon juice is essential in the production of mayonnaise. This is necessary for the flavor, stability, and preservation of the product. The proportion of vinegar used is controlled largely by its effect on the flavor. The addition of 12 per cent of cider vinegar containing 5 per cent of acetic acid appears to furnish a desirable degree of acidity and also furnishes the required quantity of fluid for the liquid phase. Distilled vinegar, which is often used, usually has a higher acid concentration. It must, therefore, be diluted with water to furnish the proper degree of acidity and the desired volume of liquid.

Salt, an essential constituent of mayonnaise, is necessary for its effect both on flavor and the stability of the emulsion. It ordinarily constitutes about 1 per cent, by weight, of the entire product.

Mustard Generally Used

Mustard is the one spice which seems to furnish the flavor particularly desirable in mayonnaise. It is used by practically all manufacturers in about the same proportion as salt. Other spices, notably pepper, are sometimes added but are not essential.

Sugar is used by some manufacturers for its effect on flavor. Its influence on the keeping quality of the product can not be regarded as favorable.

In determining the quality of mayonnaise the following factors must be taken into consideration—color, consistency, flavor, acidity, and character of emulsion, as shown by microscopical examination.

Methods have been devised by which these factors can be determined with fair accuracy. With these results as a basis the relative merits of any given sample can be readily estimated.

Causes and Prevention of Spoilage

In spite of the greatest care in its manufacture and preservation, mayonnaise must always be regarded as a perishable product. The chief causes of spoilage are separation, rancidity, and color changes.

Separation can usually be prevented by the following measures: (1) Using good materials in proper proportion; (2) securing a perfect emulsion by proper whipping while the oil is being added slowly; (3) storing at an even and fairly low temperature. The most favorable temperature for storage is approximately that of the ordinary household refrigerator.

Rancidity is prevented by the use of good materials, chiefly good oil, exclusion of air and moisture during storage, and by avoiding exposure to high temperatures.

Color changes are prevented largely by the exclusion of air. Jars should be filled full, sealed tight, and stored at low temperatures.

As mayonnaise is normally an acid product, the activity of microorganisms is not a major cause of spoilage. This may occur, however, when these organisms gain admission in large numbers, either by being carried in with certain constituents or by reason of insanitary methods of production. The prevention of spoilage of this type depends upon the use of materials which do not contain excessive numbers of microorganisms, upon sanitary methods of production, and upon keeping the acidity at the highest point compatible with good flavor.

Mayonnaise Manufacturing Machinery

American ingenuity has gone far in providing machinery which is well adapted to the manufacture of mayonnaise. The essential part of the equipment is the mixer. This can now be obtained in almost any capacity desired. The important requirements of mixers are satisfactory operation at different speeds and the proper degree of agitation without inclusion of air.

Filling machines are now provided which fill containers smoothly and evenly from the bottom up, thus avoiding inclusion of air.

Mayonnaise is now very largely distributed in glass jars. These are provided with screw-cap covers, which furnish a practically air-tight seal.

EDWIN LEFEVRE,

Assistant Bacteriologist, Bureau of Chemistry and Soils.

MEAT Grading and Stamping System in Growing Favor The Government's grade stamp on meat is becoming more and more important. Its significance from the standpoint of "consumer satisfaction" and its direct relation to quality is reflected in increased demands for Government-graded meats from all parts of the country.

The official grade stamp on meat prevents substitution and misrepresentation. Meat that bears the Government grade stamp is sold for exactly what it is.

The consuming public, although slow at the outset to appreciate the significance of the grade stamp on meats, has now rather generally come to realize it—hence the widespread demand for graded beef. Assured of quality, the average consumer returns for more. The Government's grade stamp provides that assurance. Through it retailers have come to realize that the average consumer is more concerned with quality than with price. Consumer confidence in the retail meat dealer is enhanced, repeat orders mean more business, and the livestock producer is benefited.

The official grade stamp on beef, which has now been available for two years, has demonstrated its economic value. This is now generally acknowledged by all branches of the livestock and meat industries.

It is now possible, through this meat-grading service, to handle long-distance transactions involving the purchase and sale of meats with confidence that the results will be satisfactory. Retailers place orders for Government-graded beef without having to visit the packers' coolers. The meat trade recognizes that the quality represented by a given grade name is always uniform within reasonable limits. Meat grading and stamping means a saving of time and expense and greater efficiency in retailing.

The meat-grading service has been a factor in increasing the patronage of railroad dining cars. Labor costs were reduced when it became possible to buy in accordance with official standards under the supervision of Government graders. Several important steamship lines report similar benefits. The better hotels and restaurants in some of the larger cities have taken advantage of the grade stamp. In fact, the stamp on meats is now a prerequisite in many hotels and restaurants.

Canada, after studying the results achieved in this country, has inaugurated a similar system of grading and stamping beef, and has passed legislation placing grading by private firms under the supervision of the Government. The Ministry of Agriculture in England

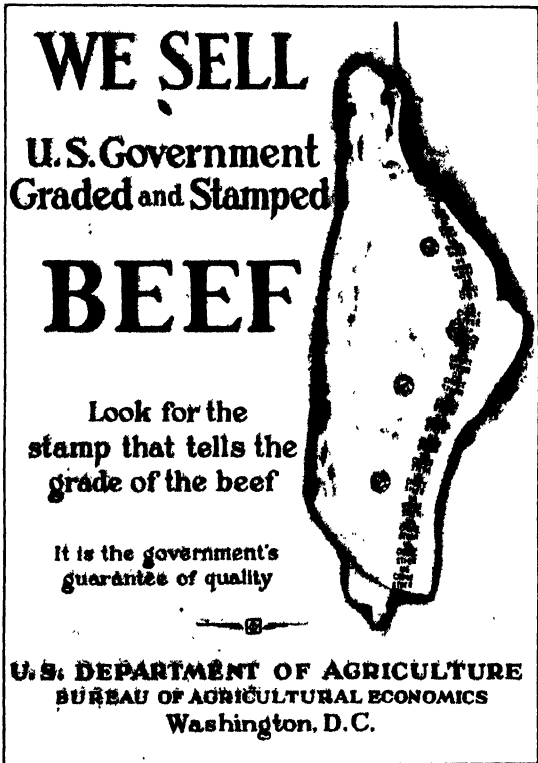


FIGURE 125.—Poster used in establishments that sell graded and stamped beef

contemplates adopting a grading system similar to ours. Apparently the meat grade stamp is here to stay.

W. C. DAVIS,

Senior Marketing Specialist, Bureau of Agricultural Economics.

MEAT Inspection Under Federal Supervision Covers a Broad Field About 75,000,000 cattle, sheep, and hogs are being converted into meat annually under the supervision of the Federal meat-inspection service.

This vast number must undergo the critical examination of trained and experienced inspectors. The work of this service begins by establishing sanitary conditions in plants where inspection is to be conducted. It is applied with equal force and care to the examination of the live animals, to the detailed performance of post-mortem examinations, and to the reinspection and supervision of all procedures in the preparation of meat and meat products.

A force of 2,450 professional inspectors and sanitary experts is required for this work at 800 establishments located in 250 cities and towns throughout the country. Besides protecting consumers, this comprehensive service is a means of locating infectious centers where diseased animals originate. It eliminates unfit meat from the food supply and insures wholesomeness, clean handling, and truthful labeling of meat and products, and is necessary in the exportation of our surplus meat.

The development of the Federal meat inspection began in 1890, when the first legislation was actuated by the demand for national certification of our meat sent abroad. This was followed by other laws which extended the Federal jurisdiction, but it was not until 1906 that Congress authorized the comprehensive control now operative.

Essential Requirements for Packing Plants

The first requirement is that meat plants shall be so constructed and equipped as to permit sanitary procedures which are described largely by the single word "cleanliness." This term involves ample distribution of water and light, effective ventilation, drainage, and protection from soiling. All these factors are dependent on the location, construction, and equipment of the plants.

When these physical essentials are provided in meat plants, the Federal inspectors assume personal jurisdiction. Their first duty is to examine the animals at close range, in motion, and at rest. They note abnormal actions and conditions. In questionable cases the animals are confined for close inspection and the taking of temperature. This ante-mortem inspection is essential to detect in the live animals certain diseases and unwholesome conditions which can not be recognized by inspecting the meat or internal organs.

The next major activity occurs when the animals are slaughtered. The veterinary inspectors are present when the lungs, heart, and other internal organs are exposed. The inspectors segregate and condemn those which are unfit for food as judged by a rigid standard for the protection of meat consumers. This procedure includes the main features of the post-mortem examination, which is an essential function of meat inspection. The fresh meat and organs found to be wholesome are

marked by the application of a harmless, purple fluid with a small, circular branding device showing the inspection legend.

Following the first inspections of the animals and of the fresh meat, repeated reinspections are made of the many cuts, parts, and products throughout all the various procedures of preparing, curing, canning, labeling, and packing. Unfit meat and products are segregated and condemned, and those fit for food are designated by truthful labels.

Laboratories Test Ingredients

Seven laboratories maintained in various parts of the country by the meat-inspection service are potent factors in the protection of health and in insuring the accuracy of labels. In the course of a year the laboratory work (fig. 126) covers the examination and analysis of more than 40,000 samples of meat products, water supplies, salts, spices, and other ingredients for the detection and exclusion of unwholesome substances. Other important activities of the service include supervision of the destruction of condemned animals and meat; the limitation of water and cereal in sausage to prevent adulteration; the cooking, refrigerating, or curing of pork to destroy trichinae which can not be discerned by any practical method of inspection; the pasteurization of dairy products used in the preparation of oleomargarine to eliminate dangerous organisms; the approval of many thousands of master labels to insure that no false or misleading statement appears on meat or container; and the supervision of meat transportation throughout the devious channels of commerce, as contemplated by law.

There are penalties ranging from \$1,000, or one year's imprisonment, to \$10,000, and three years' imprisonment for violations of the laws authorizing Government meat control. These severe provisions may or may not have influenced the smoothly operating inspection during the past twenty-odd years, but it is a matter of record that infractions have been comparatively few.

Thus the protection afforded by Government meat control includes proficient examination as to the health of the animals and an expert inspection service extending throughout all phases of converting the animals into meat and product, and even to the labeled package ready for the consumer. This service is furnished at a cost of less than 7 cents for each animal slaughtered, or about 1 cent for each 26 pounds of dressed meat and lard produced.

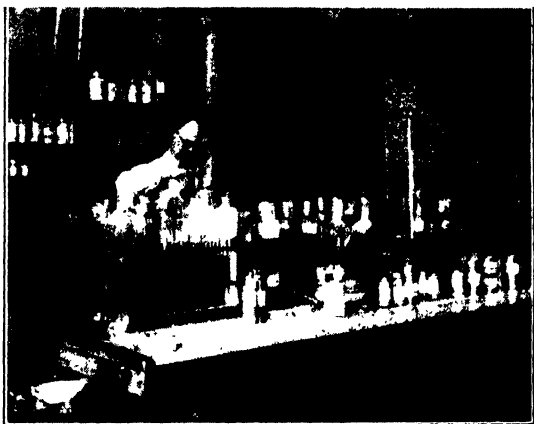


FIGURE 126. Portion of a meat-inspection laboratory

R. P. STEDDOM,
*Chief, Meat Inspection Division,
Bureau of Animal Industry.*

MEAT Investigations Suggest Tenderness May Be Hereditary When a stockman breeds or buys beef calves and places them in the feed lot he knows within a few pounds what these calves will weigh at the end of the feeding period. He can estimate within a few points what percentage of dressed carcass his finished cattle will yield when slaughtered. The cattle buyer who bids them in at the market, if he is well trained, will look at them on the hoof and judge within less than 1 per cent what they will yield on the rail.

And yet neither the farmer nor the market expert can predict with any certainty the quality of the meat of these cattle. Whether it will be coarse-grained or fine, dark red or light, tough or tender when cooked, can only be guessed. The hides of the animals may conceal points of superiority for which discriminating consumers would be willing to pay more money than that represented by the margin of profit of the man who fed the cattle. The carcasses may show a moderate covering of creamy-white, firm fat, and the knife which is used to separate the fore quarters from the hind may reveal that the animals had stored a generous proportion of their fat as marbling through the lean of their muscles. The hide of a beef steer is indeed well named. It conceals factors which largely indicate the true value of the animal.

Measure of Quality Under Investigation

For the purpose of isolating some of the factors responsible for quality in meat, and setting up standards for measuring and recognizing them, the department undertook a study of the subject in cooperation with a number of State experiment stations and other agencies. Efficiency in dairy animals has long been accurately measured by the quantity and quality of the milk produced. Poultry efficiency, in part at least, can be determined by egg production. The quality and value of a racing animal are determined by the number of minutes and seconds it needs to cover a given stretch of turf. The amount of clean wool and its fineness can readily be determined for a flock of sheep. But for meat animals the only measure of efficiency has been quantity of meat production. The quality of the meat and its tenderness and palatability when cooked could be known only after the animal had been slaughtered, and its flesh eaten.

Thus breeders of meat animals have been greatly handicapped in the formulation of any definite program for the improvement of their stock. Experiments to date indicate that the solution of the problem is in some respects simpler and in others more complex than was expected.

To any of the followers of this project who hoped that research would evolve some miraculous feed combination which would guarantee the production of ideal flavor and tenderness in the meat of all animals, no matter what their breeding, it is necessary to say that it is idle to entertain hopes for so simple a conclusion.

Some Typical Results

In a number of observed instances there was more difference between the meat of two animals of the same lot (fig. 127) than between that of two animals from two different experimental lots which were handled under widely varying methods of feeding and management.

In a lot of grade steers and heifers purchased on the Chicago market in October, 1928, to be used in this series of investigations, were a red steer and a black one which weighed within 17 pounds of each other and graded within 2 points (on scale of 100) of each other as feeder calves. After a 210-day feeding period on an excellent ration of grain, legume hay, and corn silage they showed average daily gains differing by only 0.17 pound. They differed by but $2\frac{1}{2}$ points when graded as slaughter cattle, and their carcasses lacked the same number of points of grading alike.

The two steers were absolutely consistent in their behavior at the hands of the various grading committees, maintaining the same rela-

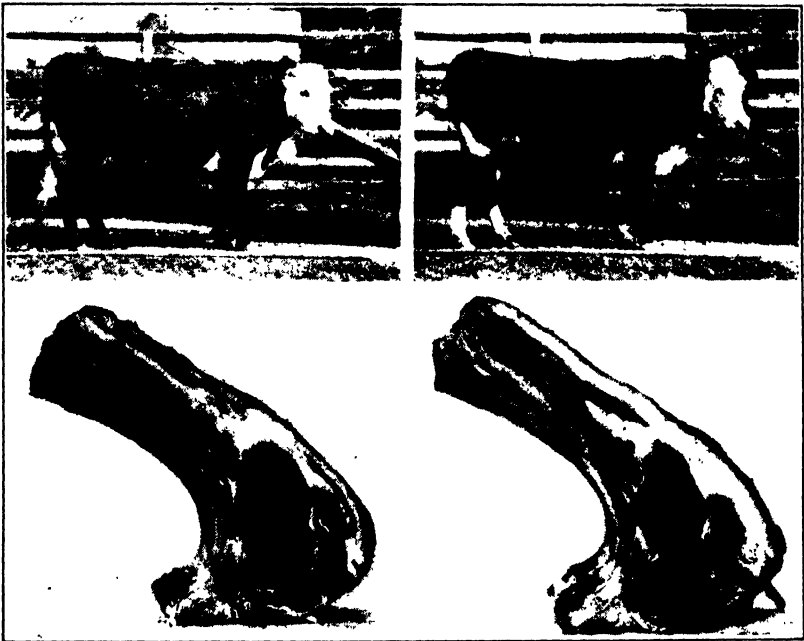


FIGURE 127.—Two apparently similar steers that yielded dissimilar cuts of meat. These steers entered the fattening period, of 130 days, weighing alike and grading alike. On the same feed—corn, cottonseed meal, and pasture—the steer on the right gained nearly three-quarters of a pound more daily and its carcass graded higher. A 3-rib roast from it (also on the right) weighed 30 per cent more uncooked and 25 per cent more cooked than the corresponding cut of the other steer, besides being juicier and superior in flavor, though both were equally tender. Such variations justify the search for more certain methods of producing superior meat animals.

tive position, with the red steer always ahead and by about the same number of points, as feeder calves, as finished cattle, and as carcasses.

When ribs from these steers were examined in the laboratory, however, striking differences were found. The rib of the black steer showed a 10 per cent larger "eye," which is the portion best for slicing in a rib roast of beef, and analyzed 20 per cent more protein than that of the red steer. This was no doubt because the red steer's rib was fatter, and showed remarkably more fat marbled through the rib eye. Its rib analyzed 16 per cent more fat in the total edible portion, and 21 per cent more fat in the eye than the rib from the black steer.

Differences in Meat of Apparently Uniform Carcasses

A mechanical test for tenderness of the cooked rib muscles of the two animals showed that a force of 5 more pounds was needed to shear the fibers and tissues in the 1-inch sample from the black-steer roast than in the red-steer roast (26 pounds for the one and 31 pounds for the other). The final verdict of the palatability committee which graded cooked samples of the meat, without knowledge of their origin, agreed with the tenderness test of the uncooked meat by rating the cooked meat from the red steer more tender by 1.4 points out of a possible 7.

Here, then, were two steers which weighed alike, were fed and handled alike, which looked very much alike except for color, which were graded very closely alike on the hoof as feeder and later as slaughter cattle, and also on the rail as chilled carcasses ready for distribution to the trade, and yet when the meat from their respective carcasses was examined striking differences were discovered. This is only one of many similar cases.

In November, 1927, a bunch of grade Hereford steers and heifers were purchased in Texas and shipped to a middle-western State experiment station, where the animals were placed on feed in the cooperative meat investigations. The history of all these animals is interesting when traced through the feed lot, the meats, histological and chemical laboratories, and finally through the cooking laboratory to the final palatability tests, but heifers Nos. 16 and 17 will be traced through quickly as constituting another case in point.

Although No. 16 weighed 75 pounds more than No. 17 at the beginning of the experiment and graded half a grade higher, the latter animal gained over half a pound more each day during a feeding period of 205 days during which they received a ration of shelled corn, oats, alfalfa hay, and corn silage. Its total gain was 115 pounds more, so that it weighed 40 pounds more than No. 16 at the conclusion of the test and had closed three-fifths of the gap in grade that separated them. No. 16 as a slaughter animal therefore scored but 2 points above No. 17. The carcass grading showed that the judges considered the carcass of the faster gaining heifer superior by nearly 3 points, or a third of a grade, to the heifer which appeared better on foot. In dressing percentage the two were within $2\frac{1}{4}$ per cent of each other.

The faster gaining animal showed considerably more surface fat and slightly less marbled fat than the other.

Then rib roasts of the two were cooked by the standard cooking method and tested. The mechanical shearing test showed that the cooked meat of the fast-gaining animal required 50 per cent more force for its shearing, and the palatability committee pronounced that this same meat was $2\frac{1}{4}$ points less tender than the other—or, in plain language, that the one was tender and the other tough.

One might conclude that the rapid gains were responsible for the sacrifice in tenderness, had the records not showed that other animals in this same test which gained equally fast yielded tender cooked meat when judged by both man and machine.

Results Point to Individuality as Chief Factor

A study of the records of this and other tests in the quality-of-meat project leads to the conclusion that individuality is perhaps the most

potent factor of all in determining whether meat shall be tender or tough, of high quality or of inferior quality.

Histological examination of muscle fibers of animals which have received the same feed-lot treatment shows characteristic differences in size, structure, and arrangement of fibers, membrane, and connective tissue. The meat of no two animals behaves in like fashion when subjected to a number of tests which have been developed.

As a check against these observations muscle from a number of the bureau's inbred families of guinea pigs has been examined. Some of these families are the consummation of 29 generations of continuous brother-sister matings. They have the same genetic characters and throughout a period of years have behaved with remarkable uniformity when measured by such yardsticks as rate of growth, size, frequency, and vigor of litters, longevity, and resistance to diseases.

Examinations to date have produced striking similarities in the muscle structure of the meat from guinea pigs of the same inbred families, with characteristic dissimilarities in that of guinea pigs of different families.

Tenderness in Meat May be Hereditary

Here, then, is a working hypothesis which promises much. Observations with small laboratory animals have borne out theories gathered when working with the larger meat animals. The smaller animals are of known breeding, free from genetic variation.

No factors known to influence the tenderness and palatability of meat have been purposely bred into these animals. Yet many or all of the factors influencing quality in meat have no doubt been segregated in them. It remains to determine them and to learn how they behave.

If it could be assumed that a single factor, unlinked with other factors, is responsible for tenderness, the problem would be simple. If many factors are concerned, the problem is more complex. These factors may be dominant or recessive, but in any case it is theoretically possible to produce animals which will breed true.

The ultimate aim will be to develop strains of the larger domestic animals that will breed true to a definite standard of quality. They will be superlivestock, not perhaps in size, nor in weight-gaining ability, but in the quality of their products.

E. W. SHEETS,

Principal Animal Husbandman, Bureau of Animal Industry.

MEXICAN Bean Beetle's Damage Severe After Record Winter Survival The Mexican bean beetle survived the winter of 1928-29 in the southern and eastern Atlantic States in the largest numbers hitherto recorded and as a result beans were seriously injured during the season of 1929 where control measures were not practiced. The beetle is now known to be present along the Atlantic Coast from Georgetown County, S. C., to northern New Jersey. It was reported as far south in South Carolina as Dorchester County. To the northeast it has spread into three counties of Connecticut.

In Michigan its spread increased 40 miles westward, but the beetle apparently did not survive in Ingham County, where it was found last

year. Likewise in Indiana it spread 20 miles west, into Kosciusko County, but could not be found in Whitley County, where it was found in 1928. In southern Indiana it reached the Illinois line at Vincennes in Knox County, 20 miles west of the 1927 limit of distribution in that section. Considering the new infestations in Hardeman County, Tenn., and Benton, Tippah, and Lowndes Counties, Miss., together with those given above, it would appear as if this pest will gradually spread over the Mississippi Valley. (Fig. 128.)

Reports from the Southern States indicate that the beetle has been more numerous and injurious than at any time since it reached the eastern part of the United States.

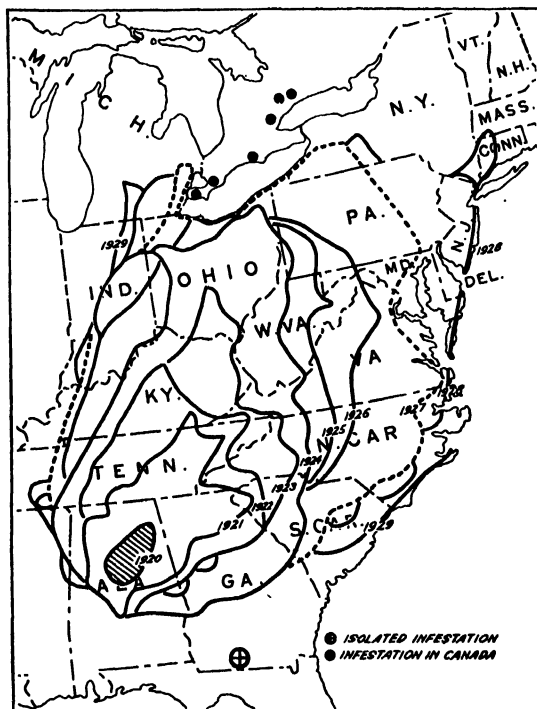


FIGURE 128.—Distribution and spread of the Mexican bean beetle in the Eastern States, 1920-1929

Important Bean Districts Invaded

For the first time since its discovery in the East in 1920 the Mexican bean beetle has invaded the important bean-growing districts of the Eastern Shore section of Maryland, Virginia, and Delaware. Fortunately this extensive bean acreage is on level land which is well adapted to the use of power or tractor driven spraying machinery. A large number of the growers and canners in that section equipped themselves early in the season to treat the bean crop, and the result has been in general a satisfactory control of the pest, especially where

liquid spraying has been practiced, the best results being obtained by the use of magnesium arsenate. By the use of 8-row sprayers a large acreage can be covered effectively at a minimum expense, and the successful control of the beetle in this important bean-growing area now appears certain.

Hibernation records obtained in Ohio for four years compared with records obtained in Alabama for eight years, and in other Southern States, indicate that the survival of the Mexican bean beetle depends to a large extent on the minimum winter temperatures. The survival in the Southeastern States is many times greater than the survival in the Northern States. It seems quite likely that the Mexican bean beetle will not survive the winters in either Michigan or New York in sufficient numbers to build up a population that will cause great damage to the bean crop except during mild years. During the past

few years the insect has become rather abundant by late summer in Chautauqua County, N. Y., along Lake Chautauqua, but is scarce in Erie County, immediately to the north. While it has not as yet caused any damage in the bean districts of Michigan or New York, it should be watched carefully.

NEALE F. HOWARD,
Senior Entomologist, Bureau of Entomology.

MIGRATORY-BIRD Refuges to be Increased Under New Conservation Act

In passing the migratory bird conservation act, the Seventy-first Congress gave its approval to the adoption by the

Federal Government of a comprehensive plan for bird protection through the creation of refuges. The act, which was signed by the President on February 18, 1929, authorizes the provision of funds to survey, acquire, and establish large tracts of land and water throughout the country, to be maintained thereafter and for all time as sanctuaries for birds of species that migrate between this country and Canada. Unquestionably the act comprises the most significant and important item of Federal legislation enacted for the protection of wild life since the passage 11 years before of the migratory bird treaty act. By the nature of its provisions it indicates public acceptance of the sound principle that game laws and regulations on hunting can not alone be relied upon to maintain forever our native birds and animals.

The truth is well established that modern conservation methods in wild-life administration, while not failing to take due cognizance of the effect on game of the annual kill by the gunners, must also give equal attention to the less direct influences of civilization and industry. The changes produced by many forms of industrial activity in the natural environment of the native wild creatures, make it more and more difficult for them to live. Among such influences are deforestation, with its attendant destruction of cover, stream pollution, damaging fires, and drainage. These matters, particularly drainage and the diversion of water from natural reservoirs and channels, are influences of such vital significance to water birds, mammals, and fish as to suggest the axiom that in order to protect wild life Americans must protect its habitat. In this brief axiom is comprehended the purpose of the migratory bird conservation act.

In their earlier history American wild-life conservation policies were chiefly concerned with the enactment and enforcement of measures that restricted hunting, and at that time the need for action to preserve the habitat was not so apparent. Then it was of obvious and immediate importance to curb the slaughter of game for the market, and to modify the laws that permitted spring shooting, a pernicious practice under which in some localities certain species of game birds might legally be taken without restriction as to numbers for nine months of the year. It was evident also that nothing less than action by the Federal Government would serve to bring about the harmony of effort so necessary for the uniform protection of the migratory birds that twice every 12 months visit practically every section of the continent from the Arctic regions to the Gulf coast and beyond.

Principle of Federal Control

The migratory bird law of 1913 advanced the principle of Federal control of these species by enjoining spring shooting and through its influence on the public mind, but it failed to accomplish all that the situation demanded. The migratory-bird treaty of 1916 between the Government of the United States and that of Great Britain gave the solid foundation for necessary legislative action in this country and in Canada, and the migratory bird treaty act, passed in 1918, gave the treaty effect in the United States, as did the migratory birds convention act in Canada. By the provisions of the Federal law, Congress definitely placed with the Department of Agriculture the responsibility for the administration, protection, and maintenance of stated groups of the migratory birds. The Secretary of Agriculture was authorized to make regulations establishing open seasons and defining the manners and methods by which ducks, geese, and shore birds could legally be taken. Funds have been annually appropriated to enforce the act.

Immediately, under the authority of the treaty, the open seasons on migratory game birds were reduced to not to exceed three and one-half months in each year throughout the country; and spring shooting was forbidden, as also were the marketing and commercialization of migratory game. Bag limits were established, and, in spite of the rather limited funds available for enforcement of the regulations, important advances were made in checking the wasteful, thoughtless, and greedy practices that hitherto had prevailed.

The rattle of the guns in the marshes in early spring was stilled; no longer were the carcasses of ducks and geese, slaughtered by the thousands and shipped in carload lots, displayed for sale in the city markets. Here and there, as might be expected, individuals broke the laws and, as is done to this day, carried on a furtive illegal poaching business, but the total effect was small, as compared with such practices during the long years when unrestricted shooting was the rule and not the exception.

Changes in the Habitat of Game

But with these changes, accomplished only after many years of ceaseless effort, other aspects of the problem became apparent. In the period while sportsmen and nature lovers alike were fighting for harmonious and effective legislative control of game killing, vast changes were taking place in the land on which the game species had been living. Chief among these was the tremendous decrease of the natural marsh and water areas brought about by drainage. Accorded a saving protection from the evils of overshooting, the waterfowl were now faced with a menace of even greater magnitude, since it threatened to destroy the particular areas so necessary to their existence. The time was at hand for definite corollary action to support sensible restrictions upon the gunner by adopting methods to conserve the birds' habitat.

There are some wild birds and animals the habits of which are such that they can not only adjust themselves to a changed environment but they may even benefit by such change and by a moderate degree of association with the human population. To the water birds, how-

ever, the water areas in marshes, lakes, swamps, and rivers are the greatest essential to existence. No one can raise justifiable objection to the drainage and reclamation of water and marsh areas when it can be shown that the result will be of definite benefit to mankind; but when, as has often happened, the destruction of a marsh zone not only brings no such benefit, but instead destroys to no purpose the habitat of many valuable birds, animals, and fishes, the undertaking inspires public regret and ultimate reproach.

The establishment of a great national system of wild-fowl sanctuaries—even though it may require years to accomplish—will prevent the total and irreparable destruction of many important portions of the natural wet-land environment that still remains. With such areas set aside as refuges, it should not be difficult to maintain migratory game birds in reasonable abundance for all time to come. While the new migratory bird conservation act refers specifically to migratory birds and seeks to maintain feeding, nesting, and resting grounds for the various ducks, geese, shore birds, and others, actually there are numerous additional species, including mammals and fishes, that will find sanctuary in these refuges.

No Shooting in Refuges

The fact that no shooting of beneficial species on these areas will be permitted is of peculiar significance, for with the constant decrease of territory adapted to waterfowl, the distribution of shooting stands has a deleterious effect on the birds, one that in driving them from their feeding and resting grounds is nearly if not quite as destructive from the standpoint of game conservation as is the shooting of great numbers of birds each year by hunters. Modern facilities for rapid individual transportation, such as are supplied by the automobile and the motor boat, have enabled gunners to penetrate to areas once isolated and remote. In consequence, vast tracts of marsh and bog that once, because of their inaccessibility to hunters, served the wild fowl as natural sanctuaries, are now shot over as regularly as are resorts more conveniently located. In some regions during the open seasons the birds have no opportunity to feed or rest during the daylight hours.

In order to carry out the purpose of the new law, it is necessary to ascertain by examination of the numerous potential areas to be found throughout the United States those that are best adapted for refuges, to make appraisals in order to determine their character and value, and to conduct other activities incident to their acquisition. The Migratory Bird Conservation Commission created by the act will consider and pass upon lands examined by the Bureau of Biological Survey and recommended by the Secretary of Agriculture for purchase or lease for refuge purposes. The Secretary of Agriculture is chairman of the commission, and the other members are the Secretary of Commerce, the Secretary of the Interior, two members of the Senate, and two members of the House of Representatives. In addition, to provide for cooperation with the States, the head of the game administration branch (or if there is no such office, then the governor or his representative) is made a member of the commission to consider and vote on all questions relating to the acquisition of refuge areas in his State that come before the commission.

Appropriation for Refuge-Land Investigations

An appropriation of \$75,000 was made available on July 1, 1929, for use in the work of investigating lands proposed for acquisition as refuges. This preliminary work is in charge of crews of trained biologists and land-valuation engineers working under the direction of the Bureau of Biological Survey. Annual appropriations amounting to a total of \$7,875,000 for the 10-year program of land acquisition and refuge establishment are authorized by the act, and a continuing appropriation of \$200,000 annually thereafter for the maintenance of the refuges.

The units selected for migratory-bird refuges must be of such character as will best serve the purposes contemplated. Usually they will be more or less extensive areas of lowland, comprising marsh and woodland contiguous to or embracing water areas, or they may be areas that were formerly well suited as feeding and nesting grounds for migratory birds, but though now useless by reason of drainage developments or evaporation, are subject to restoration to their natural condition. The reports by the crews engaged on surveys will necessarily have a determining influence in the final selection of units for acquisition and maintenance, but an effort will be made to furnish in every general section at least one extensive refuge, so that the benefits of the system will be available to the birds everywhere throughout the country.

The new conservation measure indicates unmistakably that the United States of America recognizes the tremendous importance of its migratory birds as aids in the development of agriculture, for esthetic purposes, and as a food supply and a source of wholesome recreation.

H. P. SHELDON,
*United States Game Conservation Officer,
Bureau of Biological Survey.*

MIGRATORY Status of Mourning Doves Is Proved by Banding

The mourning dove (*Zenaidura macroura*; family Columbidae), known also as turtle dove and Carolina dove, is distributed over the North

American Continent from Panama to southern Canada. This is the greatest range of any American member of its family. As its food consists almost exclusively of seeds and grain, the mourning dove is of considerable importance to the farmer, and its value is enhanced by its being an important game bird in many States.

Few birds exert a stronger esthetic and emotional appeal than do mourning doves. The trim beauty of their form, the soft delicate shade of coloring touched by spots of metallic luster, the whistling sound emitted by the rapid beat of wings in the swift arrowlike flight, and the soothing plaintive quality of their cooing love-note have almost a universal appeal to the finer human sentiments.

Mourning doves nest over the entire United States. The two white eggs are laid in a flimsy nest of sticks usually situated in the lower branches of a tree but sometimes on the ground in the eastern portion of their range. The most important section of their winter range is in the southern part of the country.

Found in South the Year Round

In many States, particularly in the South, mourning doves may be found during every month of the year, and it is probable that some of these individuals are not migratory to any considerable extent if at all, but remain in practically the same region throughout the year. Nevertheless, in common with other migratory species, mourning doves are protected by Federal law. On the basis of information then available regarding their interstate and international movements, a judicial decision was rendered in the Federal court at Athens, Ga., in 1921, which pronounced these birds entitled to the protection afforded by the migratory bird treaty act, even though individuals of the species may remain yearlong within the borders of certain States.

With a view to assembling more complete and definite information regarding their migratory movements and habits, more than 4,000 mourning doves have been banded since 1921 by volunteer cooperators of the Bureau of Biological Survey. From these more than 250 return records already have been received. A study of the scientific data thus obtained definitely establishes the wide-ranging character of the migratory activities of these birds and provides additional positive information in support of the judicial decision cited.

Figure 129 shows only a few examples of these flights, as it is impossible to include on so small a map all of the information now available.

Some of the lines, however, represent return records for three or four different birds the points of banding and recovery of which were approximately identical. Banding mourning doves has revealed many detailed specific facts that are of interest and significance in connection with the annual northward and southward movements of the birds and their status as migrants entitled to protection under the provisions of the migratory bird treaty act and the regulations promulgated thereunder.

As with studies of banding returns of other kinds of birds, it is necessary to consider the movements of mourning doves from two standpoints: (1) Those birds that have returned to the region where they were banded and have been retaken there after the lapse of a full migration season; and (2) those that have been recaptured and reported from points at some distance from the place of banding.

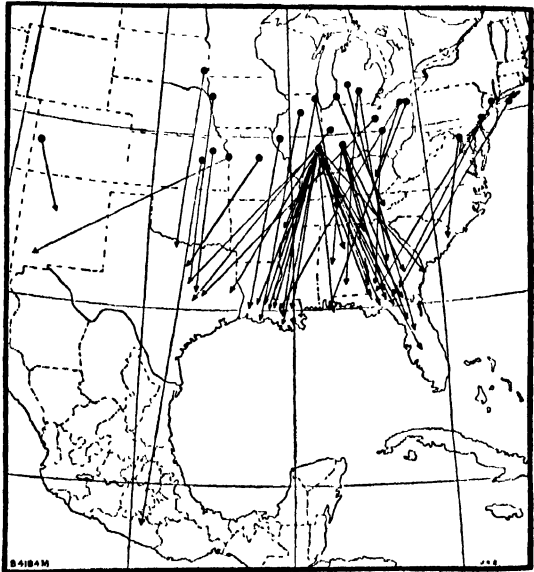


FIGURE 129.—Migratory routes of mourning doves as shown by banding records. Black spots indicate places where the birds were banded; arrows point to localities where the same individuals were recaptured. The straight lines are not intended to represent the actual course taken by the birds in their flights, but to connect points where banded and recovered.

Return to Former Nesting Places Proved

Under the first category abundant evidence has been obtained to prove conclusively that mourning doves may return many times to breed again in the locality where they nested during previous years. At one banding station in central Illinois no less than 66 return records have thus far been reported of individual doves that had been banded at this point in former years. The records of the Bureau of Biological Survey contain similar cases from Pennsylvania, Ohio, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Georgia, Louisiana, Texas, and California.

Considered by themselves these records might be construed to mean that these doves did not migrate at all, but had remained near the point of banding throughout the year. This mistaken interpretation is particularly apt to be made because it is known that mourning doves occasionally will spend the winter as far north as Massachusetts, Indiana, Illinois, and Colorado. Such cases are rare, however, and observations made continuously throughout the year in these regions have shown that there are few, if any, doves present there during normal winters. Furthermore, in the Central and Northern States the return records of birds recovered at the point of banding were obtained during succeeding breeding seasons and not during the winter months, which in itself indicates that the birds are accustomed regularly to go south in the fall and to return the succeeding spring. A few individuals have been retrapped at the same banding station in two successive years. For example, two birds banded in April and May, 1925, at Kansas, Ill., were recaptured at the same point in 1926 and again in 1927, while one banded at Crystal Bay, just north of Minneapolis, Minn., in June, 1925, was recaptured there in June, 1926, and again in July, 1927.

Some of the doves that were banded in the Southern States late in the winter or early in the spring probably made no migration to the North but nested in the same general region. It is significant, however, that in the case of all reports of the return of doves banded in such Southern States as Georgia and Louisiana, there was a period of several months or a year between the dates of banding and recovery, which would allow the birds to make a trip to the North and back again during the interval before being retaken.

Final Proof of Migration

The final evidence to establish completely the migratory status of mourning doves is furnished by many birds that have been banded in Northern States and recovered far away in the South, either during the same or in succeeding years. It is interesting to note from banding records of such birds that the majority of the doves that breed in the Northern States apparently spend their winters in the States of Georgia, Louisiana, and Texas. This is graphically illustrated by the map, which shows points of banding and recapture of doves for which return records have been received.

The State of Georgia seems to contain the favorite wintering grounds for the mourning doves of the eastern part of the country. No less than 15 records have come from that State, representing birds that were banded in Illinois, Michigan, Indiana, Ohio, Pennsylvania, New York, and New Jersey. Louisiana comes next, with 12 records, but

strangely enough these come from only two States: Illinois and Ohio. Texas ranks third, with 9 records of doves banded in South Dakota, Iowa, Kansas, Missouri, Illinois, Indiana, and Ohio. Six doves banded in Illinois, Michigan, Indiana, and Georgia were recovered in Florida, and five others from Illinois, Michigan, Indiana, and Ohio were taken in Alabama. Along with these records of recoveries in the principal winter range of the species, there are many intermediate points represented in the banding records, giving returns for these birds from points scattered through South Carolina, Tennessee, Kentucky, Arkansas, and Missouri.

As in all groups of return records from banded birds, there are a few cases of unusual flight routes, two of which are shown on the map. One is of a young bird that was banded at Kansas City, Kans., in June, 1927, when it was just beginning to fly, and was shot in Luna County, N. Mex., on September 17, 1927. This bird had flown southward instead of following the course due south, as did other birds banded in the same general region. The other record was of a bird banded at Fort Riley, Kans., on July 5, 1926, and shot at Apipilulco, State of Guerrero, Mexico, in January, 1927. This represents the longest migratory flight yet recorded for a mourning dove.

To sum up the meaning of the facts deduced through application of the banding method for determining the migratory movements and status of mourning doves, it has been conclusively shown that these birds are migratory in habit and that their flight is both interstate and international; that they may return to the same point to breed during succeeding years; and that there is a marked tendency for birds reared during summer over a widely distributed area in the northern part of their range to congregate during winter in a relatively restricted region in the South. Establishment of these facts is of importance in considerations of their esthetic worth and economic status and in taking effective steps to afford them adequate protection.

FREDERICK C. LINCOLN,
Associate Biologist, Bureau of Biological Survey.

MORTGAGE Debt on U. S. Long-term loans secured by farm
Farms Increasing But land and buildings continue to
at a Decreasing Rate grow in importance as a means of
financing the American farmer.

According to recent estimates, the total farm-mortgage debt rose from \$7,857,700,000 in 1920 to \$9,360,620,000 on January 1, 1925, and further increased to \$9,468,526,000 by January 1, 1928. These figures represent an increase of 19 per cent from 1920 to 1925 and a further rise of 1 per cent from 1925 to 1928.

For the 3-year period ended January 1, 1928, the largest relative increase in mortgage debt occurred in the South Atlantic States, an increase of 12 per cent above the debt in 1925. The debt in the East South Central group increased 7 per cent, in the West South Central and East North Central 5 per cent, and in the Pacific group 3 per cent.

Four geographic divisions showed declines in amount of farm mortgage debt, the Mountain States having a reduction of 7 per cent below the amount in 1925, the West North Central 2 per cent, the Middle Atlantic States 3 per cent, and the New England group 1 per cent.

Debt on full-owner farms and part-owner farms constitutes much the most important part of all farm-mortgage debt, the total for these forms of tenure being \$5,560,017,000 in 1928, while debt on all tenant-operated farms amounted to \$3,644,009,000, and debt on farms operated by managers was only \$264,500,000.

Of a total of 22,352 farms which had not changed ownership or tenure during the period 1925 to 1928, 8,159 carried mortgages on January 1, 1925, and 8,327 had mortgages on January 1, 1928. This was an increase of about 2 per cent. All forms of tenure showed increases in the percentage of farms mortgaged. The frequency of debt among all full owners in the above group increased from 36.8 per cent to 37.1 per cent, and on tenant-operated farms from 35.9 to 37.5 per cent, while the mortgage frequency of the total of these classes, plus manager-operated farms, rose from 36.5 per cent to 37.3 per cent of the number of farms reported.

Debt on Part-Owner Farms

Part-owner farms generally have a much higher frequency of debt on the land owned than do farms of other forms of tenure. This increase of approximately 40 per cent is a natural consequence of the heavier financing requirements for operating additional land. Farms operated by tenants usually have lower frequency of farms mortgaged than do farms operated by owners, partly because the owner generally does not finance current farm operations. However, the percentage of mortgaged tenant-operated farms appears to have increased to a point not far below the frequency of mortgaged owner-operated farms.

Inquiry concerning mortgage changes on those farms which transferred title during the three years following 1925 indicates that the number of such farms mortgaged had increased also, and that the amount of mortgage debt carried was larger than in 1925. Mortgage debt often arises incident to transfer of land whereby the buyer obtains a loan on the land as a means of partial payment.

As a whole, the results indicate that farmers have been using their land as security for loans to an increasing extent during recent years and that this has been true of farms which have remained in possession of the same owners as well as of those which have changed hands.

Certain significant differences appear in the debt changes occurring in the various geographic divisions. In general, the States of the South Atlantic, East South Central, and West South Central groups showed increases in the order named. On the other hand, the Western States, which have been farmed a shorter period of time, showed the greatest decreases. It may be noted that the mountain and western lands were the first to show marked decline in value after the World War. Now it appears that the western areas are the first to show reductions in the volume of farm mortgages.

Increases For Each Form of Tenure

Increases for the country as a whole appeared for each form of tenure although tenant-operated farms showed a greater rise than did farms operated by their owners. This increase of debt on tenant farms probably was due in part to the fact that the debt on this class of farms in 1925 was a definitely smaller percentage of their value than was the case with owner-operated farms, and consequently loan

agencies were willing to increase the loans on many tenant farms having moderate encumbrance, despite a generally more restrictive policy on new loans and a frequent reduction on renewal of loans.

Ratios of debt to value of mortgaged farms offer further light on developments in farm mortgages. The reports from over 22,300 farms scattered throughout the country, when taken as a group, showed a ratio of debt to value of full-owner farms of 40.4 on January 1, 1925, and of 39 three years later. The ratio on tenant-operated farms rose from 36.6 to 37.5 and on manager farms from 32.1 to 32.7. The similar ratio for the total of these farms declined from 38.5 to 38.1.

When the data are adjusted to reflect current conditions in each State and are expressed as a ratio of total mortgage debt to the value of all farms, whether mortgaged or not, it is found that the ratio rose from 11.8 in 1920 to 18.9 in 1925, and to 20.9 in 1928. It thus appears that the amount of farm mortgages at the beginning of 1928 was slightly over one-fifth of the value of all farm land and buildings in the United States.

DAVID L. WICKENS,

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NEMAS Causing Plant Galls Controlled Best Through Crop Rotation The control of plant diseases caused by eelworms or nematodes, often called nemas, is extremely difficult because the soil around infested plants is always contaminated and is a source of continual reinfestation. If nemic pests were restricted to the plants proper, control would be possible by destroying them. A hot-water treatment could be applied to valuable nursery stock, such as bulbs, corms, tubers, and dormant and even growing plants. Such a treatment is already in use to rid bulbs of the bulb or stem nema, *Tylenchus dipsaci* (110° to 111.5° F. for two and one-half hours); to kill the root-knot nema, *Caconema radicum* (formerly called *Heterodera radicum*), in infested roots (118° for half an hour); or to cure strawberry plants of the strawberry nema, *Aphelenchus fragariae* (118° for half an hour). The value of this method in the fight against noxious nemas is not limited to the saving of valuable plants. It affords also an opportunity to check the distribution of such pests through infested nursery stock.

The main problem, however, in our battle against nemic pests is to grow crops on contaminated soil to free it of the infestation. Chemicals of various kinds (carbon bisulphide, calcium cyanide, etc.) have been tried, with more or less success but in no instance with full satisfaction. The reasons for nonsuccess are varied. The soil is an extremely difficult object for chemical treatment because of its varied chemical and physical structure. Chemicals applied in solid, fluid, or gaseous form may be changed before their action takes place, and soil water, air pockets, etc., interfere. Such treatments may be impracticable also because of the expense involved or because of danger to health during application. Drowning also has been tried but thus far without great success. The root-knot nema was found to be still active after five months' submersion. Fallow with absolute control of the weeds and repeated tillage exposing the soil well to the sun's rays has been found very helpful in the fight against root knot, but not so

much so in other cases, e. g., the sugar-beet nema (*Heterodera schachtii*). Soil sterilization by heat is successful but can be applied only to greenhouse, seed-bed, and similar soils. But there is a disadvantage connected with all the mentioned methods, in that beneficial organisms also may be destroyed and the physical and chemical character of the soil is unfavorably influenced.

Underlying Principle of Control Methods

Therefore control methods based on the behavior of noxious nemas toward various plants have been developed. The underlying principle of all these methods is the fact that some nemas prey only on one or a few species of plants, or, if many are attacked, some are given preference. The citrus nema (*Tylenchulus semipenetrans*) has been found only on members of the citrus family. The root-knot nema, however, is already known to attack about 700 various plants. Plant-parasitic nemas recognize and locate the hosts they prefer. Strange as it seems, the preference shown by a population of one species to one kind of plant, e. g., the bulb or stem nema (*Tylenchus dipsaci*), is not shared by all the populations of this same species. Thus the bulb nema in some locations may exhibit a preference for narcissus and may not, or only with much hesitation, attack another host plant. On the other hand, a population feeding on this latter host will not go to narcissus. Such observations have been made frequently on various species of plant-infesting nemas. (Figs. 130 and 131.)

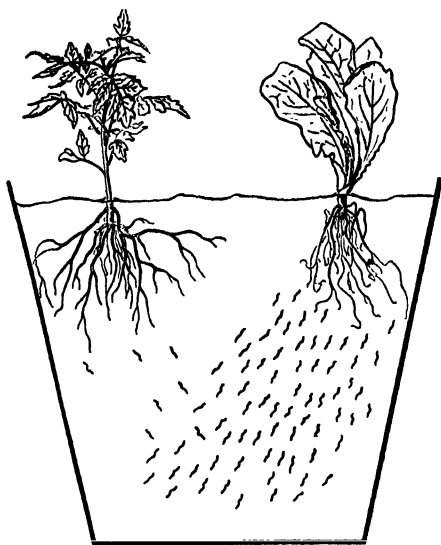


FIGURE 130.—Diagrammatic sketch of the behavior of a population of the root-knot nema which came from a greenhouse where lettuce had been grown continually on the same soil for some time. The nemas developed such a preference for lettuce that tomatoes were not, or only slightly, attacked. (The figure shows the results of an experiment with this population. In this pot with heavily infested soil ten times more nemas attacked the lettuce than the tomato.) Yet the latter plant is usually conceived as one of the most susceptible and easiest attacked. This illustrates very plainly how a crop planted again and again in the same infested soil is soon destroyed by the rapidly increasing pest.

planted to barley, which is usually conceived to be nonsusceptible. In the first two years no remarkable injury occurred, but in the third year the crop was destroyed by the nema before harvest. Numerous examples of this kind could be added. The explorer Stefansson¹⁰ again and again made the observation that a dog team accustomed to a certain diet (e. g., fresh-water fish or seal meat) would not eat food new to it, and often the dogs preferred to starve. Once he made

¹⁰ STEFANSSON, V. FRIENDLY ARCTIC; THE STORY OF FIVE YEARS IN POLAR REGIONS. p. 61 et seq., illus. New York. 1921.

an experiment and tried to teach his dogs to eat wolf meat. He writes:

The dogs were kept tied in one place and supplied each day with a dish of fresh water. A piece of wolf meat was placed beside the dish every day and allowed to remain there all that day. This meat was then destroyed, for we were afraid it might begin to putrefy and we wanted to see how long the team would go hungry before eating meat that was quite fresh and still retained the full wolf odor. During the second week five of the six dogs gave in one by one, but at the end of the fourteenth day the last dog had not yet touched it. He was the oldest of the team, which was doubtless why he was the most conservative. He had been the fattest of the lot at the beginning of the experiment and at the end of the second week he was practically a skeleton.

Food Preferences of Nemas

These observations are mentioned here because the attitude that plant-parasitic nemas exhibit toward plants new to them as food is similar to the one these dogs took to meat new to them. The plant species that has been a host for generations is seemingly preferred and

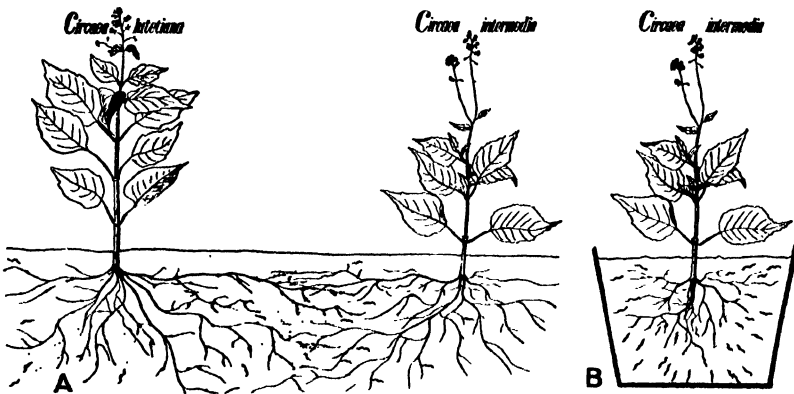


FIGURE 131.—Diagrammatic sketch of the behavior of another population of the root-knot nema. In A, two closely related species of plants are growing together; their roots are mixed and cross over. Yet the nemas were found only on the roots of one of the species, *Circaea lutetiana*, which they all seemed to prefer. Soil with infested roots was then taken, put in a pot, and a specimen of the avoided *C. intermedia* planted. B, Having nothing else to feed on, the nemas accepted this new host with some hesitation. (After a figure published by the author in *Phytopathology*, vol. 15, p. 506, 1925)

is most easily recognized and most quickly located. Apparently this preference becomes more pronounced the longer a population lives on a certain host plant. That is one reason that a soil, if once infested and then planted again and again to the same crop, will become unfavorable for that crop; but this behavior is also used as a basic principle for various control methods, one of which is the trap-plant method. Infested soil is planted to a preferred host (the seeds should be cheap, the plant of easy culture and quick growth). After the plants are well infested, but before the nemas have had time to mature, the crop is destroyed (by plowing and exposure to the sun, by chemicals, etc.). This method reduces the number of nemas, but it requires labor and needs rather careful surveillance as to the proper time of crop destruction.

However, the main control method, based on the principle of host preference and host specificity of noxious nemas, is crop rotation. These pests should never have an opportunity to adapt themselves to

a given crop and then multiply rapidly to billions and billions. Crop rotation prevents this. The nemas will most often hesitate before they attack a new host; meanwhile the crop gains time, or, if immune crops are used, the nemas will starve.

Crop Rotation the Best Preventive

Crop rotation is the best mode of prevention. If a nemic disease should by any means contaminate a soil (by infested seeds, infested nursery stock, which has undoubtedly been one of the main factors in the spread of nemic pests, tools and implements with adhering infested soil, dirty shoes, irrigation water, etc.), crop rotation may prevent its establishment. But if the pest is already established, crop rotation is one of the best means by which a soil can be cleaned. Whereas other methods involve expense, this sometimes can be made a paying proposition. It will not destroy the beneficial organisms; the texture and nature of fertile soils are not damaged; and the plants are not injured, as is often the case after a chemical treatment. Eventually, green-manuring crops or cover crops may be used.

In case an established infestation is to be controlled, these rules should be followed wherever possible:

In no instance use biennial or perennial crops if they are not known to be absolutely immune. Never plant on infested soils orchards or groves of plants not known to be absolutely immune.

Choose preferably immune crops for the rotation scheme.

If host plants have to figure in the rotation, choose those that are known to be the least susceptible or use the ones that seem to be botanically the most different from the crop most seriously attacked. In no case choose crops of the same family as those which suffered severely unless they are known to be absolutely immune.

Use, if possible, quick growing and quick maturing rotation crops.

Preferably place the susceptible crops in the rotation scheme in that season of the year which is least suitable to the species of nema involved.

Try to give the crop a good start before the active season of a nemic pest arrives.

If satisfactory results are to be obtained from rotation, remember that it is absolutely necessary to keep the weeds out. Experience has shown again and again that weeds make null any attempt to control certain nemic pests by crop rotation. Usually the same weeds come up season after season. Only too often are they also attacked by noxious nemas, especially if no other suitable host is present, and carry the pest over any length of a rotation period.

Crop rotation is the cheapest and most practicable preventive and control measure that is known.

G. STEINER,

Senior Nematologist, Bureau of Plant Industry.

NITROGEN is Fixed in Nature Almost Wholly by Microorganisms Nitrogenous compounds are found in nature largely as constituents of organic matter and to a lesser extent as inorganic salts, such as nitrates and ammonium compounds. Most of the combined nitrogen is found in the upper layers of soil, where plant residues accumulate. A considerable portion is also present in living plants and animals, most of which originally came from the soil and will be returned to this medium when these organisms die. Coal, likewise, contains nitrogen in organic forms which was stored up by plants and removed from circulation in nature ages ago. In addition, there are a few natural deposits of nitrates scattered over the earth's surface, but for the most part limited

to Chile. The total of all of these sources of combined nitrogen is comparatively small and would soon be used up were it not for the fact that nature is constantly replenishing the supplies. In fact, all the combined nitrogen found on the earth presumably existed at one time as free nitrogen gas in the air.

The emphasis placed upon nitrogenous compounds in fertilizers, and upon fixation methods, may not seem justified in view of the fact that nitrogen is only one of several chemical elements necessary for normal plant growth. Nitrogen, however, stands out as particularly important. Not only are nitrogenous compounds deficient in most soils, expensive to supply, and difficult to retain, but they play an exceedingly important part in plant growth. Life itself is dependent upon this element.

Two Methods of Natural Fixation

There are, so far as known at present, only two methods by which nitrogen is fixed to any appreciable extent in nature: (1) Electric discharges in the atmosphere result in the fixation of about 1 or 2 pounds of nitrogen per acre annually; and (2) various nitrogen-fixing microorganisms, either living alone or in combination with higher plants, are found rather generally distributed in soils and water. These organisms account for most of the nitrogen fixed in nature. We do not as yet know the mechanism of the fixation processes used by these lower plants; we do not have a very accurate idea of how much nitrogen is fixed yearly; nor do we know all of the plant species which are able to utilize free nitrogen.

Three types of lower plants have been shown definitely to possess the ability to live on media containing no form of combined nitrogen, utilizing air nitrogen as the sole source of supply. These comprise several strains of bacteria, one group of fungi, and certain species of blue-green algae. Frequent claims have been made that other plant species, including higher green plants, possess this power of nitrogen fixation, but these claims have not been generally accepted. Some workers even claim that nitrogen fixation is a property of most or all plant life, which manifests itself in varying degrees in different organisms. This is, however, an extreme viewpoint for which there is no definite proof.

Two Groups of Bacteria Concerned

There are two groups of bacteria concerned in nitrogen fixation, the free-living or nonsymbiotic forms, which are found in practically all soils, and the symbiotic or legume-nodule bacteria, found living in soils and in the root nodules of leguminous plants. The nonsymbiotic bacteria use the decaying plant and animal residues as energy sources for growth and fixation. Most of these species prefer the well-aerated soils, but some thrive in the absence of air. The quantity of nitrogen fixed per acre per year by these forms is not known but has been variously estimated at 5 to 40 pounds for various soils. Any estimate that may be made can be only an approximation because our information is limited largely to laboratory studies and does not include actual field data. Frequent attempts to increase crop yields by inoculating soils with these bacteria have for the most part given negative results. The general recommendations for increasing nitrogen fixation by these organisms are to apply sufficient lime to keep the soil from becoming

acid, maintain the organic matter by returning all crop residues, and add phosphates and potash, if needed. Fortunately, all of these recommended practices are the ones commonly followed in good farm practice.

The legume-nodule bacteria are normally found widely distributed in soils. However, there are several strains of these, and no given strain will inoculate all species of legumes. If a legume is grown on a soil that has previously produced good crops of the legume, usually the plants will show nodules without inoculation. The addition of the bacteria is always advisable unless it is definitely known that the soil is already satisfactorily inoculated.

Fixation Capacity of Legumes

Recent work has shown that there is a difference in the nitrogen-fixing capacity of various strains of the nodule bacteria; hence, inoculation may sometimes prove profitable even though the soil already contains the bacteria. The quantity of nitrogen fixed per acre of legumes in a year commonly varies from 50 to 200 pounds. Present information indicates that neither these bacteria nor the higher plants alone fix nitrogen, but both must work together. Hence, the quantity of nitrogen fixed on a given soil will vary with the vigor of growth of the leguminous plant; likewise, with the quantity of available nitrogen present in the soils. Where plenty of fixed nitrogen is present leguminous plants fix little, but where the supply is very limited the plants, which are well supplied with nodules, secure practically all from the atmosphere. In general, then, with the exception of soil-nitrogen supply, the soil conditions which favor plant growth likewise favor nitrogen fixation.

The second type of microorganism which has been shown to fix nitrogen is the fungi or molds. Numerous studies with these organisms have shown that probably only two strains can fix nitrogen. Their importance from the standpoint of nitrogen fixation is not great.

The third group of nitrogen-fixing plants is the blue-green algae, commonly found as green scums on ponds; also in soils and sea water. Their economic importance is not known, in fact it was only during the past year that workers in Germany and in the United States Department of Agriculture, working independently, definitely proved that these green plants can use free-nitrogen gas.

Much Research Done on the Problem

A great amount of research has been conducted, particularly during the past 50 years, to determine nature's methods of using free-nitrogen gas. The aim of these studies, other than scientific interest, has been (1) to determine the plant species which can use nitrogen gas, (2) to find out how to use these natural methods to increase crop production, and (3) to develop commercial methods for supplying various nitrogenous salts at will for use as plant foods and in the industries. The success of commercial fixation methods is well known; nitrogenous compounds may be prepared from atmospheric nitrogen now at will in any quantity desired. However, we still rely on nature for approximately 90 to 95 per cent of our annual requirement. Our aim should be to encourage nature by keeping the soil in proper condition for vigorous nitrogen fixation by free living organisms and to grow as

many leguminous crops as farm practice will permit. We may then supplement nature's sources of nitrogen supply with commercial-fixation products to bring the level of crop production to any practical limit desired.

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Senior Chemist, Bureau of Chemistry and Soils.

NITROGEN'S Functions in Plant Growth Make Cheap, Ample Supply Essential Nitrogen is probably the most important element, all factors considered, with which we are concerned in agriculture to-day.

In the gaseous form it constitutes approximately four-fifths of the atmosphere, but it is only after it has entered into combinations with other elements that it becomes a food material for most plants. In forms such as ammonia, nitrates, and various organic combinations it is indispensable for the existence of all forms of life. The great emphasis that has been placed on securing adequate and cheap sources of fixed nitrogen for agriculture and the industries is, therefore, justified. Constant cultivation has brought about a depletion of the supplies by removal in crops, by leaching, and by escape to the atmosphere in gaseous forms.

In addition to water the chief constituents of most plants are proteins, carbohydrates, and fats. In addition, there are many other compounds such as organic acids, pigments, essential oils, etc., which are found in varying percentages. Other than the mineral constituents found associated with these materials, nitrogen is the only element necessary for the synthesis of these substances which is not readily obtained from air and water by higher plants. The energy needed for the building-up processes is supplied by sunlight through the agency of chlorophyll. Nitrogen is especially needed in the synthesis of proteins, it being present in these substances to the extent of about 16 per cent. Proteins in combination with nucleic acids constitute the most essential part of protoplasm, the material found in all living cells and in which the life processes center. Growth, reproduction, and repair all depend upon proteins and in turn on nitrogen. Chlorophyll also contains nitrogen, and hence even the ability of plants to use the energy of the sun in building up carbohydrates and fats is dependent upon this element.

Since the primary function of nitrogen in plant tissues is in connection with growth and reproduction naturally the portions of the plant where these processes are most active are relatively high in this element. In the early stages of growth leaves and growing tips are very rich in nitrogen; later, as maturity approaches, the proteins are transported largely into the seeds.

Nitrogen Makes Leaves Green

The effect of an abundance of nitrogen is not only to produce heavy growths of foliage but almost invariably the leaves exhibit a deep rich green appearance. Conversely, nitrogen starvation results in stunted growth and a decided yellowing of the foliage. An excessive supply of nitrogenous compounds in the soil may in rare instances result in such an exceedingly rank growth of stems and leaves as to be somewhat

harmful. In such cases the plants are less hardy and more easily attacked by diseases; in addition, maturity may be delayed to such an extent as to decrease the yield through injuries by frost. If the crops have sufficient time to develop to maturity, an extra large production of foliage may not be harmful because the surplus food materials are largely transported to the seeds or other storage organs. These remarks, of course, do not apply for crops grown for their leaves.

The practices to be followed in the application of nitrogenous fertilizers should conform with the ideas presented above. Nitrogen is needed particularly for early growth; hence, it should be applied to spring-sown crops chiefly at the time of planting. In the case of cabbage, lettuce, hay crops, and other crops grown for their foliage the rate of application may be relatively high. If the growth period for such crops is short, one application may be sufficient; otherwise subsequent top dressings may be profitable. Where a continuous growth of succulent leaves is desired, as in the case of pastures, frequent applications are advisable if economically feasible.

Nitrogen for Small-Grain Crops

Where nitrogen is needed in moderate amounts, as for grain crops, early single applications are most commonly used. This application should be made at about the time of seeding for corn; small-grain crops usually respond best to early spring applications, but this will vary with the crop, time of sowing, available moisture, and numerous other factors. It is always wise to consider the fertilization program in relation to the available soil-nitrogen supply. In the early spring this supply is very low, but as the soil warms up the organic matter is gradually converted into nitrates. In the better soils this nitrate supply is usually adequate to care for the crop demands throughout the hot summer months. It is during the early spring months that this natural supply is very deficient, and this explains why market gardeners commonly secure such excellent results with heavy applications of nitrates in the early spring. Whatever the practice followed, so far as nitrogen is concerned, it is necessary to bear in mind that most soils also require phosphorus and potash; hence a complete fertilizer is usually more profitable than nitrogen alone.

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Senior Chemist, Bureau of Chemistry and Soils.

OATS of Fulghum Variety Win Place in Southern States

Most oat varieties grown in the United States have been introduced from foreign countries or have originated as selections from introductions. The Fulghum variety, however, is the one outstanding exception. It is distinctly American in that no variety like it is known in any other country.

The variety originated a few decades ago as a plant selection from a field of Red Rustproof on the farm of J. A. Fulghum near Warrenton, Ga. It probably resulted from a natural cross between Red Rustproof and some other variety. Such field crosses are not uncommon. From this beginning Fulghum has spread throughout the southern half of the United States and become one of the most important varieties.

Fulghum was first grown as a fall-sown variety in southeastern Georgia. It did not become of importance as a spring-sown variety until about 1920. In recent years it has attained its greatest usefulness for spring seeding in that area lying between the great spring-oat belt of the North and the winter-oat belt of the South. Fulghum has proved so well adapted as a spring-sown variety in this area that a new and rather definite oat belt is indicated. Growing this variety has made oats a much more certain crop than formerly in this area.

Fulghum, like Red Rustproof, is a so-called red oat. Red oats usually are considered to be descendants of the wild red oat (*Avena sterilis* L.), which is supposed to have originated in the Mediterranean region of southern Europe. Wild red oats still may be found growing in that portion of Europe and in northern Africa. This offers an explanation for the suitability of cultivated varieties of red oats to the southern portion of the United States.

Fulghum differs from Red Rustproof in being from a week to 10 days earlier. Fulghum usually grows a little taller than Red Rustproof and produces slenderer kernels with fewer awns and basal hairs. The peculiar horseshoe-shaped cavity at the base of the kernels also is not so large nor so prominent in Fulghum as in Red Rustproof. In the field Fulghum is readily distinguished from Red Rustproof by having more erect panicles (heads). They are small to mid-sized, spreading, and very erect.

Former Varieties Not as Well Adapted

In the area where Fulghum has become the important spring-sown variety the spring seasons often are short and cool. However, sudden changes to excessively hot weather frequently occur, even early in the season. Oats are more susceptible to heat injury than are other small grains, and often are seriously injured by such decided changes. An early, vigorous, and heat-tolerant variety such as Fulghum, therefore, is valuable. Previous to the advent of Fulghum for spring seeding in this area the farmers grew such varieties as Burt (also known as Early Ripe, June, May, etc.), Red Rustproof (Red Texas, Texas Red), or some of the early northern varieties, which are better adapted farther north in the Corn Belt.

Burt, while early and heat resisting, never was entirely satisfactory because of its lack of uniformity. It contains an unusual number of off-type plants, many of which are undesirable. Burt has rather small, slender kernels, of various colors, and usually also is inferior to Fulghum in bushel weight and yield.

The Red Rustproof variety usually is too late for best results in Missouri, Kansas, and Oklahoma. In Kansas, especially, it was grown for many years from spring seeding for want of a better adapted variety. Owing to its late maturity, yields often were reduced by dry weather or other unfavorable conditions. Red Rustproof has not been satisfactory for spring seeding in the territory in which Fulghum has become the dominant variety.

The northern or common oat varieties never were altogether satisfactory in the southern part of the Corn Belt. In seasons when cool weather continued until well into the spring fair yields were obtained, but slightly delayed seeding or early hot weather often resulted in light, poorly filled grain.

Fulghum and Its Strains and Their Characteristics

The acreage devoted to spring-sown red-oat producing States was about 8,000,000 acres, according to the 1920 census. It is estimated that probably 5,000,000 acres were of spring-sown red-oat varieties. Since 1919 the acreage devoted to spring-sown red oats has increased considerably in Kentucky, Missouri, and Kansas, and in the southern parts of Ohio, Indiana, and Illinois. It now is estimated that upward of 7,000,000 acres are devoted to spring-sown red oats. A large percentage of these are Fulghum or its strains, of which Kanota is one of the most important.

The possibilities of Fulghum for spring seeding were first recognized by the Kansas Agricultural Experiment Station, where the strain later named Kanota showed considerable promise in the early experiments conducted by that station. Kanota was first distributed to farmers of Kansas in 1919, and in 1926 it was estimated that over 1,000,000 acres of the variety were grown in Kansas alone. Fulghum or Kanota also is grown rather extensively in Missouri, Oklahoma, and northern Texas, and to some extent in the southern parts of Ohio, Indiana, and Illinois, Iowa, and Nebraska, and in eastern Colorado.

Frazier is another strain of Fulghum. It was developed at substation No. 6, Denton, Tex., by the Texas Agricultural Experiment Station for February seeding in northern Texas. Frazier is very similar to the original Fulghum, but usually produces more awns than the parent variety.

Disadvantages of Fulghum

Although the discovery of the value of Fulghum for spring seeding has proved of economic value to oat growers in the central spring-sown red-oat area, the variety has several deficiencies.

So far no strain of Fulghum has been found which resists stem rust (*Puccinia graminis avenae*), and none which has given evidence of resistance to crown rust (*P. coronata*). Practically every year both rusts influence oat yields in the area. Formerly it was believed that Fulghum was resistant to, if not immune from, the loose smut (*Ustilago avenae*) and covered smut (*U. levis*) of oats. Recently it has been discovered that Fulghum is not resistant to all physiological strains of these smuts. Efforts are being made by the United States Department of Agriculture, in cooperation with several of the State agricultural experiment stations, to develop strains of Fulghum resistant to these diseases.

Satisfactory control of smuts may be accomplished rather easily by treating the seed with formaldehyde.

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PAPAYA Growing in South Florida Has Made Some Headway

If you are weary of the routine of grapefruit or orange juice with your breakfast and have a taste for adventure, you might ask your fruit man at

the market for a papaya. He may look puzzled and protest there is no such fruit, but he should know better and recognize that the tropical papaya is an admirable substitute for the melons that it somewhat resembles and a pleasant variation from the citrus fruits.

The papaya belongs to a genus of about 20 species which are native to tropical and subtropical America, with the common species (*Carica papaya*) occurring naturalized through the keys and hammocks of Florida. The plant has been carried about the world, however, until it is now known throughout almost all tropical regions. All the species are of rapid growth, making unbranched trees up to 25 feet in height which are of striking appearance with large leaves and abundant melonlike fruits borne in the axils of the leaves along the upper part of the trunk, giving the plant a singular and characteristic aspect.

The problems of the cultivator are several. The first one, and that which has caused the greatest difficulty in the selling of the crop, is the difficulty of establishing a strain of fruits that are of high and uniform



FIGURE 132.—Commercial planting of papaya

quality. The papaya produces three types of plants bearing respectively staminate, pistillate, and perfect flowers. The first are useless for fruiting, and the second must be pollinated by male or by perfect flowers.

Since papayas are still commonly grown from seed, it is necessary that a strain be developed which shall produce a high percentage of perfect or pistillate flowers. Such a strain has been in existence for some time in F. P. I. No. 28533, which was introduced from the Canal Zone in 1910 and has been largely used in Florida. This strain has the further advantages of uniformity of fruit size and quality as well as good shipping characteristics.

Its Culture Has Many Perils

It seems unfortunate that a plant with so many possibilities for culture in southern Florida should be surrounded by so many perils, but perhaps these are no more than beset the peach or the pear. Being

strictly tropical, the papaya must be grown out of the reach of freezes. It can not stand flooding or a high water level. It requires a constant supply of moisture. On sandy lands it is subject to root knot, but it can be managed there as an annual crop. Its leaves may be attacked by a leaf fungus, but this can be managed by sprays. The pickle worm, the papaya fruit fly, and now the Mediterranean fruit fly must all be considered as possible enemies. The latter damages the fruit chiefly at the time of ripening, and this may be circumvented by bagging and by good technic in ripening fruits off the tree. This technic has not been entirely worked out as yet, so that some fruits reach the market in a condition really unfit for eating.

The important thing for the papaya at this time is a recognition of its value as a fresh fruit maturing at a season when melons are not avail-

able except by import or greenhouse cultivation. While the papaya is in no sense a substitute for melons, it can be eaten much as they are, cut in half and chilled. The rinds are thin, and the fragrant tender flesh is eaten as is that of the muskmelon. The crops mature from December to March, with scattered production thereafter. This later ripening fruit may be used locally for the production of marmalade, which is of a rich, deep, honey-yellow color and delicious flavor and should provide in time another variation among the marmalades now made from various familiar fruits.

In other countries the green fruits are used boiled, much as we use

summer squash, and the leaves, particularly those of *Carica quercifolia*, are boiled with meats to soften them by the reported action of the papain content. In Ceylon the green fruits are scored and the milky latex which exudes is collected and dried to form the papain of the pharmacopoeia. Whether the papaya will become so fixed a member of our American orchards as to furnish not only winter fruits but vegetables and medicine as well remains to be seen, but in any case the interest in raw foods, both fruit and vegetables, that is now current should be extended to include the papaya, and no initial strangeness should prevent the purchaser from learning to like it any more than the occasional poor muskmelon dims one's hope of a really excellent specimen.



FIGURE 133.--Fruiting habit of papaya

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PAPER Mulch Use in Ornamental Plantings Has Proved Effective

The introduction of paper mulch into agricultural practice in the United States has been followed by the demonstration of its effectiveness with a wide variety of crop plants over an extended area. The process consists essentially in covering the ground around the plants with suitable paper. As yet the cost of the paper does not appear to permit its general economic use with crops having a low value per acre, but in the culture of an appreciable variety of specialized crops paper mulch seems well on its way toward becoming an asset in crop production. Its use in the home garden is extending rapidly, where, with increasing familiarity with the method, it is giving results in satisfaction out of all proportion to its cost.



FIGURE 134.—Roses in the third season with paper mulch. Pine needles serving as a naturalistic covering. Aurora Hills, Va.

Although the chief interest in paper mulch centers about its use in the production of crop plants and crops, the effectiveness of the paper with other plants has been widely attested. The use of paper mulch in ornamental plantings about homes and in estates and parks is being followed with interest as a possible extension of the practice. In the production of young evergreens, flowering shrubs, and annual and perennial flowering plants of various sorts it has been of decided advantage from the standpoint of growth response and weed suppression. Just as in the case of crop plants, these results have been obtained under a variety of seasonal and soil conditions, and it appears that growing experience with the process may permit many producers of flowers and ornamental plants to make extensive use of it.

Esthetic Effects with Ornamental Plantings

Ornamental plantings from the cultural standpoint are roughly of two sorts—the plantings reestablished every year and the more or less

permanent plantings of hardy perennial plants. For the annual plantings the papers of what is known as type A appear quite suitable, while for the permanent plantings papers of type B are indicated. The use of paper mulch for ornamental plantings appears to have the same advantages of plant stimulation and weed suppression that it has for crop plants, and likewise the same disadvantages related to cost and application. In addition, with ornamental plantings the use of paper mulch has an uncertain esthetic effect. Its artistic value in ornamental plantings depends on the point of view and the basis of comparison. In the home vegetable garden the paper establishes an alignment of plant rows and creates an impression of order and neatness that is generally pleasing. In the ornamental garden the appearance of the paper depends a great deal on the neatness with which it is laid and the sizes of the plants being treated. In many cases it is not objectionable when so used, but if found so, naturalistic coverings may be advantageously applied.

Methods of Applying Paper

Ornamental plantings of herbaceous annuals and perennials, whether formal or naturalistic, lend themselves readily to the use of paper mulch. Field seeding may be accomplished through the paper by means of a small dibble, or the smaller seeds may be drilled in between adjacent strips of paper as with field-seeded plantings of vegetables.¹¹ When plants are grown from seed between strips of paper, however, special precautions must be taken not to delay any necessary hand weeding, since the weed growth is similarly stimulated if given an opportunity to develop. In seeding through the paper by means of a dibble the weed competition is less serious.

In establishing ornamental plantings of herbaceous annuals or perennials by transplants the smaller plants are usually set through the paper with a suitable dibble. In some cases in which large plants were used they were first set into the bed and thoroughly watered, after which the paper was fitted to the soil space about them with some overlapping. The paper as used in formal plantings may be held in position by soil placed over the outer edges, when the size of the beds permits, or it may be held with wire staples. When paper is fitted about the larger plants set out into beds it is usually held with wire staples through the overlaps. As used in all informal plantings, the paper is also held with staples.

In making ornamental plantings of woody perennials, whether formal or informal, the plants are usually set out and watered thoroughly, after which the paper is applied to all exposed soil, usually being overlapped and held with wire staples. In establishing hedges and formal borders with such plants, however, a strip of paper is first laid and notched along one side at the desired intervals. The plants are then set in at these intervals, after which a second strip of paper is laid to overlap the planting edge and is held with wire staples. The outer edges of both strips may be held with soil or with staples, and when used in this way a straight-line planting is assured.

¹¹ The method is described in: FLINT, L. H. SUGGESTIONS FOR PAPER-MULCH TRIALS. U. S. Dept. Agr. Circ. 77, 8 p., illus. 1929.

Practice of Some Nurserymen

Some nurserymen have adopted the practice of applying paper mulch about woody plants after transplanting and following copious watering in their permanent location. Similar use has been made of paper mulch in the planting of young shade trees along highways and in estates and parks. In these instances, however, perhaps the greatest importance has been attached to the effectiveness of the paper in aiding the plant to establish itself in new surroundings, and through such use it is evident that the survival of the plant is less dependent upon subsequent attention than would be the case in the absence of the paper. In such special and temporary instances the unsightly appearance of the paper may possibly be disregarded, but as a permanent accessory to ornamental plantings the black surface is not generally pleasing.



FIGURE 135.—Young rhododendrons in ornamental planting treated with paper mulch. Pine needles used as naturalistic covering. Aurora Hills, Va.

Naturalistic Covering

As previously indicated, the artistic value of paper mulch applied to ornamental plantings is variously appraised. In both the annual and permanent plantings the paper when neatly laid is frequently pleasing in appearance without additional naturalistic covering, and in many cases fast-growing plants will soon obscure the paper in any event. When the appearance of the paper does not seem satisfactory, however, various materials may be applied to the surface of the paper. The commonest of these materials is soil, and when the beds are fairly level a layer of soil placed on the paper may be satisfactorily retained. When thus applied the soil also holds the paper so that wire staples may be unnecessary. In some cases surprising results have been obtained with vegetables and flowers when the paper was completely covered with soil in this fashion, but ordinarily from a standpoint of plant response alone the black surface of the paper is a distinct asset.

Other materials which have value as naturalistic coverings for paper mulch in ornamental plantings are pine needles and peat moss. The

pine needles are available in rather limited and decreasing areas, but may be preferable to soil both in appearance and in resistance to washing, especially on sloping areas. The use of pine needles as a naturalistic covering for paper mulch with ornamental plantings is shown in Figures 134 and 135. The area in roses shown in Figure 134 had been mulched for two previous seasons with type B paper. The covering of pine needles was subject to some disintegration during the winter, requiring a supplementary top dressing in the spring. The area in rhododendrons shown in Figure 135 had been mulched the previous year with type B paper.

In many regions it is a common practice to spread a layer of peat moss on the soil as a mulch about ornamental plantings. The moss conserves moisture, reduces weeds, and makes an attractive soil covering. Paper mulch has been effectively used previous to the application of peat moss in such plantings, where it increases the moisture and suppresses weeds more efficiently than does the moss alone. Peat moss in bales is readily available in the floricultural trade.

The application of naturalistic coverings to paper mulch without doubt reduces the absorption of solar radiation, but the advantages of moisture retention and weed suppression remain, and these may often be so appreciable as to make the practice well worth while. Some attention is being given to the manufacture of mulch paper more attractive as a background for ornamental plantings than the black paper, but as yet no such papers are available.

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PART-TIME Farming Is Common in Alliance With Rural Industries

Europe is well aware of the economic and social advantage of the skillful dovetailing of small farming with rural industries. North America is slow in recognizing this advantage. Yet it is becoming evident statistically that part-time farming in the United States is a fact to deal with; that many a small American farmer is already looking to various rural industries to help him make a living; that many other small farmers have idle time. This suggests that a well-considered plan of developing better relations between rural industries and small farming will assist both agriculture and industry.

Much industrial work other than farming is already done by farm people. Some data on this subject are given in the 1920 census of farm population. The farm population of eight regionally representative counties, numbering 188,285 farm people, was tabulated with respect to persons gainfully employed. It appeared that 70,783 persons 10 years of age and over were gainfully employed in all occupations, and that 7,538 of these were gainfully employed in nonagricultural occupations. These nonfarming occupations included mining, manufacturing, transportation, retail trade, public service, professional service, clerical and domestic service, mail carrying, telephone operating, school-teaching, nursing, laundering, bookkeeping, stenography, millinery, and dressmaking.

These figures give some assurance that there is economic and social fitness in the alliance of farming with industry. Special recent studies of the Department of Agriculture throw further light upon the matter.

On 500 farms in southeastern Ohio and in the mountains of Kentucky, the operators on virtually half the farms—nearly all small farms—worked only part of the time at farming, the rest of the time being given to labor off the farm. At nonfarming work these farm operators made on an average as much cash income as the farm itself yielded. They worked in railroad shops, in coal mining, at carpentry and painting, in sawmills, on roads, hauling, in grain elevators, buying and selling livestock. But even with these outside sources of income, the material standard of living of the operators on small farms was not more than half that on the large farms of the Nation.

Evidently the part-time farmer in question is engaged from necessity, not from pleasure, in something besides farming, but apparently he prefers this manner of living to any other within his reach. His family has the benefit of living on the land. He can raise a family on a modest income. The land gives work to his children in a manner that is not harmful to them. He has the proverbial freedom of the countryman. The near-by work off the farm fits precisely into this type of farming. But the fact that the outside work is near by is more or less accidental; and part-time farming is accordingly precarious. National or State action to make this situation more secure and to stabilize the alliance between part-time farming and rural or urban industries, would seem to be in order. Certainly there is need for more information.

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PASTURES Have a Wide Variation in Feeding Value for Livestock Although the value of pastures has long been recognized and studied by investigators, there has recently been a renewed interest in the subject.

Such developments in nutrition as the necessity for vitamins, the importance of mineral salts, and the effects of deficiencies of these food factors furnish a broader basis of study than previously existed. Pasture grasses are particularly good sources of vitamins, minerals, and in many cases a high grade of protein.

Inquiry has been extended into the nutritive value of pastures, the deficiencies that may occur in them, and means of increasing their value by the use of well-selected feed supplements, on the one hand, and the enrichment of the soil and pasture management on the other. The nutritive value of pasture is subject to considerable variation. The pasture may consist largely of one type of grass, such as bluegrass, or of a variety of grasses and legumes. Climate, soil, and grazing affect the distribution of plants.

Closeness of Grazing Affects Value of Pasture

Different stages of plant growth greatly modify the nutritive value of pasture. Young grass, consisting largely of leaves and comparatively little stalk, is richer in protein and soluble carbohydrates and is more readily digestible than older grass in which more stalks have developed. These conditions point to the proper method of utilizing pasture. The grass of a pasture grazed sufficiently close to keep the young leaves growing and to prevent the development of too much

stalk has a higher feeding value than one in which the stalks are allowed to develop. The relatively high protein content of the leaves of young grass and the high nutritive value of the proteins indicate that the supplement needed for young and closely grazed pastures is a relatively high carbohydrate feed, such as corn, rather than high protein supplements. British investigations show that complete grazing once in three weeks during a good growing season is sufficient to maintain the high nutritive value of a pasture.

The season, particularly the quantity and distribution of rainfall and the temperature, has a considerable influence on the composition of pastures. Seasons of heavy rainfall stimulate the growth of grass whereas dry periods retard it. Seasonal variations then become problems that must be met in the utilization of pastures.

Livestock Health Depends on Certain Minerals

Enrichment of the ground with fertilizer has a marked effect on the rate of growth and composition of grass. The poor development of livestock and certain clinical symptoms shown by them have been traced in many cases to mineral deficiencies in the soil and plants. Although these deficiencies in most cases may result only in retarded growth of the animals, in others they may be sufficiently great to result in definite symptoms that may be characterized as disease. An example of such a condition is a deficiency in phosphorus. In animals grazing this kind of pasture the chief symptoms are a morbid appetite, stiffness of joints, and a staggering gait. The animals may eat such substances as dirt or bone. In such cases the disease has been checked or cured with the administration of bone meal or sodium phosphate or by a shift to a pasture known to contain sufficient phosphorus.

In some parts of the country the vegetation is deficient in iodine, and the lack of this element causes goiter and often hairlessness of the new-born young. These effects are largely corrected by including in the rations a feed containing iodine. Pastures low in calcium have been held to be the cause of the maldevelopment of the bones of horses. A close relation between the mineral content of pasture and the development and stamina of horses has long been recognized. Recent research has indicated also the relation between certain mineral constituents, such as copper and possibly manganese, and the utilization of iron by animals.

These examples illustrate not only the possible deficiencies that may exist in pastures, particularly those that have been overgrazed or long used or are in unusual geological situations, but also the value of pastures as a source of mineral elements. Add to this the high nutritive value of the protein they afford and it is evident that the high regard in which pastures are held by livestock men is justified.

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PEPPER Weevil has Spread Steadily in Southern California. The pepper weevil, *Anthonomus eugenii* Cano, an insect which closely resembles the cotton-boll weevil in appearance and in feeding and breeding habits, was first found injuring peppers in this country in southern Texas in 1904. Like the cotton-boll weevil, it is supposed to have come from Mexico.

It is now known to occur within the United States in Texas, New Mexico, and California.

Discovered in southern California in 1923, when growers of bell peppers in Los Angeles County suffered considerable loss, this serious pest of the pepper crop has spread gradually until at the present time all of the pepper-growing districts of the southern part of California, with the exception of the Coachella and Imperial Valleys, are known to be infested. Fortunately the damage to the crop has not been severe every year. These yearly fluctuations in infestations are governed largely by climatic conditions which prevail during the winter period. During mild winters the pepper plants remain partially green throughout the winter months, thus providing food for the insects, with the result that the next year's crop of peppers is subject to a heavy infestation early in the season from the brood of weevils which had an opportunity to develop in the old pepper fields.

The greatest damage to the pepper crop since the discovery of the pest in California occurred during the season of 1926. The winter preceding this season was unusually mild, and a great number of pepper plants remained green throughout the winter. The overwintering weevils survived on these plants in large numbers, and a brood had developed by the time the new pepper crop had reached the budding and bearing stage. This was followed by such an abundance of the insects by the end of the season that attack upon the flower buds prevented setting of the pods. The loss to the pepper industry in Orange and Los Angeles Counties for that year amounted to about one-half million dollars. The winter of 1927-28 was similar to that of 1925-26, the weevils surviving the winter in even greater numbers than in 1925-26. Extreme losses were in prospect, but the adoption of effective control measures prevented serious loss to the pepper growers.

Principal Damage Done in Grub Stage

Owing to the manner in which the pepper weevil feeds and develops, it is particularly destructive to all varieties of peppers (*Capsicum*) grown in the United States. The immature forms or grubs feed and develop within the flower buds and pods, and the adults feed upon the buds and pods as well as the foliage. The principal damage, however, is through the feeding of the grub within the pepper pod or blossom bud. Infested pods are revealed first by a shrivelling of the stem and a yellowing of the calyx, the latter symptom being especially characteristic. The infested pods finally turn yellow or prematurely red. The contents of the pod turn black and may become a mass of decayed tissue and frass, the extent of this injury depending on the number of grubs developing in the same pod. Even pods which appear sound may display this condition when opened. Heavily injured pods are generally malformed, but some pods may be injured to the extent of being worthless without giving any external evidence of such injury. Large numbers of the injured pods drop prematurely, and those which remain on the plant and mature are often marred by the holes made by the adult weevils as they emerge from the pod. Feeding or egg punctures in the surface of uninfested pods of the varieties used for canning lower their quality, since the injured areas appear as black spots when the product is canned. Feeding punctures, egg punctures, or developing larvæ within the flower buds may cause them to drop from the plant.

In California the weevil does not hibernate but is more or less active throughout the winter season. During warm periods it feeds upon the pepper plants which have withstood the frosts, and upon the common nightshade (*Solanum nigrum*). The latter plant, which grows abundantly along ditch banks and in uncultivated areas, plays an important rôle in the life of the pest in California, since it provides winter food for the insect, especially when the winters are severe enough to kill the pepper plants remaining in the old fields. The weevil also breeds in the fruits of nightshade.

A Comparatively Long-Lived Insect

The pepper weevil is a comparatively long-lived insect. A single female is capable of depositing an average of 300 eggs. The eggs are laid singly, but a number may be placed in each pod. As many as 20 grubs have been taken from a pod only an inch in length. Upon hatching, the grub feeds within the pod until mature, then changes to the pupal stage, and later changes to the adult stage within the pod, from which the weevil emerges. A brood of weevils will develop from the egg to the adult stage in 20 days under favorable conditions. A maximum of eight broods may develop in exceptionally long seasons, but in less favorable seasons only five broods occur in the field.

Experiments along control lines have shown that the cleaning up or plowing under of all infested pods will serve to cut down the numbers of the insect and thus reduce damage by the pest. Dusting with undiluted calcium arsenate at the rate of 7 or 8 pounds per acre at 7-day intervals has given good results, but this method of control is not entirely satisfactory, because any arsenical residue which remains on the peppers at harvest must be removed. While this can be accomplished readily in cases where the peppers are used for canning, in the case of peppers intended for drying the product must be handled very carefully after washing in order to prevent decay. The frequent use of calcium arsenate throughout the season may indirectly increase aphid or plant-louse infestations through the effect of the treatments upon the natural enemies of plant lice. The destruction of nightshade, the natural winter host of the weevil, may ultimately prove to be an important step in the control of this pest, especially in the more seriously affected districts and when the cultivated peppers are cleaned up after harvest. Experiments are now under way to determine the exact results attending the removal of the nightshade.

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PLANT Literature in World's Current Publications Listed

How is the scientific investigator to keep abreast of the mass of material which is pouring from the press? Some short cut must be provided. Abstract or review journals are the ideal means, but these of necessity are late in appearing. The Bureau of Plant Industry Library has attempted to answer the question by issuing two mimeographed lists of current literature on botany and agronomy, respectively. These appear in alternate weeks and give a cursory view of the literature that has been received during the preceding two weeks.

In preparing the botany list the publications first to be considered are the many journals devoted to botany, either to its more technical side or to applied or economic botany, as those of plant breeding, horticulture, and plant diseases. These, however, but partially cover the field, as much of the material on applied botany is found in journals of agriculture and general science. Chemical and pharmaceutical journals must be examined for articles on the chemistry of plants, and such questions as the much-talked-of vitamins often appear in food journals; the journals dealing with perfumery yield articles on essential oils; and still other special journals contain information on fixed oils and fats to be found in plants. Articles on fungicides and wood preservation will sometimes be found in such a publication as *Industrial and Engineering Chemistry*. A medical journal may contain an article on crown gall of plants or a symposium on virus diseases including plant viruses, or an optical journal, an article on the effect of light on plants.

British Publications Predominate

Among foreign publications those in English predominate because they include journals not only from England proper and Canada but from all the British Empire, including the West Indies, South and East Africa, Egypt, Australia, India, the Malay States, and other smaller scattered colonies. In a half year articles have been selected from 238 publications, 111 from England alone. Here is every range of climate; tropical and subtropical plants, as well as the large crops of so much interest in this country, are dealt with. Australia at the antipodes has many of the same agricultural problems as confront the United States; cotton is one of the large Egyptian crops; and South African plants are always of interest as representing, besides many curious and unusual ones, others like the gladiolus, which is familiar in gardens and important to commercial horticulture. In England itself are investigators whose work is known internationally and institutions that stand for the best in agricultural and horticultural research.

German publications come next, 197 having been examined during the period mentioned. They contain accounts of some of the most important work on plant breeding and crop improvement. Three new journals have come from the German press since the beginning of 1929; one on breeding, one on plant diseases, and one on the plant side of agriculture.

The French journals are third, numbering 142. They are particularly strong in tropical agriculture, as many of the French colonies are in tropical regions.

Many Countries Represented

Then follow publications from a number of countries, ranging from 47 from the Netherlands (including the Dutch East Indies, where among many important investigations those relating to rubber and sugar have particular interest to the United States), 35 from Japan (this number might be enlarged if so many were not wholly in Japanese), and 30 from Italy, to 28 from Russia. In the case of Russian publications, language is a difficulty, and one must be content with those that furnish abstracts or at least titles in familiar languages, or

that can be easily translated; but the work that the Russians are doing in breeding, soil science, and plant physiology can not be ignored.

Another group of publications includes 16 from Sweden, 15 from Switzerland, 11 from Austria, and 10 from Belgium. Next come 7 from Czechoslovakia, 8 from Poland, and 3 each from Peru and Porto Rico, and single representatives from many countries.

All these are journals that have come into the library of the Department of Agriculture in a half year, July to December, 1928, and from which material has been selected dealing with plant science. No account is taken of journals examined which yielded nothing, nor of publications in outside libraries from which articles are taken for permanent record but which are not entered in the list.

During the last fiscal year 7,291 articles were entered in the botany list from 3,034 journals. Of these approximately 800 appeared only once, the remainder being journals appearing weekly, monthly, or at less frequent periods.

The agronomy list draws its material from some of these same journals, but a large number are examined which naturally are disregarded in selecting titles for the botany list. No figures have been compiled for these, but it is safe to say that they would add a third to the number already recorded.

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POPULATION Movements The yearly movement of population from farms to cities and from cities back to the country appears to reflect the yearly changes in the condition of agriculture and of general business. According to data for the past seven years, an improvement in farm income has been accompanied by a smaller movement of population from farms, and a decline in income has been accompanied by an increased shift to industrial centers. Similarly, the movement from cities to farms has been greater in years of dull business conditions and smaller in years of plentiful employment.

These comparisons demonstrate the importance of the economic factor in determining year-to-year changes in the rate of movement from farm to city and from city to farm. They corroborate the results of a recent survey in which it is estimated that at least 7,500 out of 20,000 reporting farmers gave inadequate income as the reason for leaving their farms. They demonstrate also that the net movement from farm to city—that is, the excess of the movement from farms over the movement from cities—is a reflection of agricultural conditions relative to industrial conditions, and, finally, give evidence of one of the many interrelationships between agricultural and industrial stability.

Sources of the Data

These conclusions are based on the data in the accompanying charts. The average farm incomes used here are those reported by approximately 15,000 farmers throughout the United States for the calendar years indicated and represent the difference between receipts and cash

outlay. The population data are also estimates based on returns from about the same list of reporters. The measure of business activity is the calendar-year index of industrial productive activity as computed by the Federal Reserve Bank of New York. It is used here to represent yearly variations in industrial employment and wage earnings.

If the average farm incomes for the years 1924 to 1928, inclusive, are compared with the number of people leaving farms, a striking inverse relationship is revealed. In line with what might be expected, low farm incomes are accompanied by an increased movement away from farms and higher incomes by a slower rate of movement. (Fig. 136, upper section.)

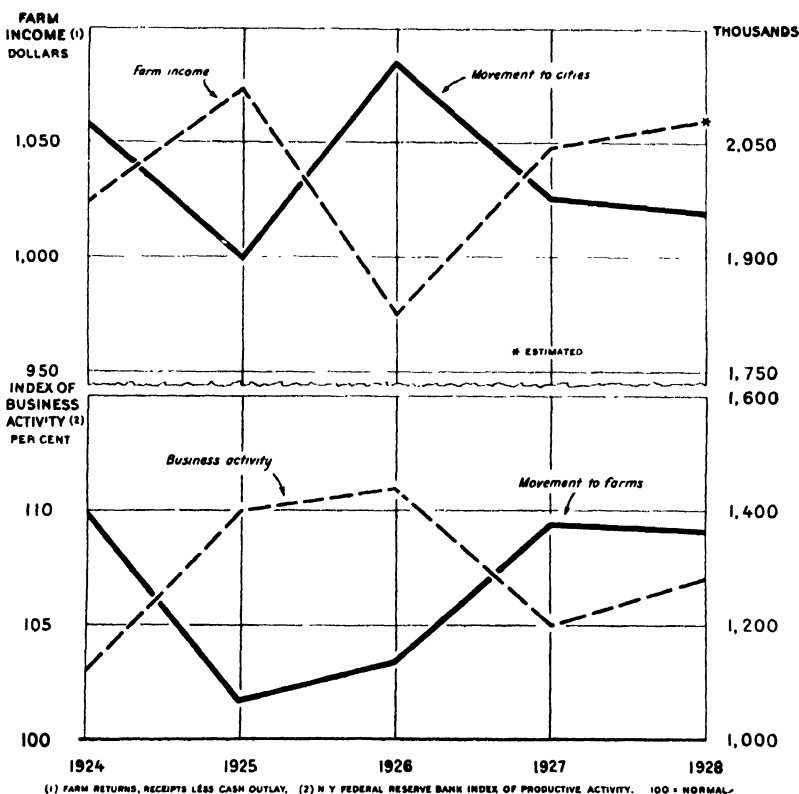


FIGURE 136.—Farm income, business activity, and population movement

A similar comparison between industrial activity and the population shifts from city to country also reveals an inverse relationship. During the years 1925 and 1926, in which industrial employment and wage earnings were relatively high, smaller numbers of people moved to the country, whereas during the years 1924, 1927, and 1928, when business activity was not at as high a level as in the other two years, the movement away from industrial centers was larger. (Fig. 136, lower section.)

These two comparisons tend to establish rather clearly the fact that the yearly variations in population shifts from farms are predomi-

nantly affected by agricultural conditions, and that the variations in the movement from cities are predominantly affected by industrial-employment conditions. (Fig. 138.)

Effects of Good Industrial Conditions

There is some evidence in these data to indicate that the movement from farms may also be influenced by good industrial conditions. For example, the large number leaving farms in 1926 may reflect both the reduced farm incomes of that year and the high rate of industrial activity; and the greater movement from cities to farms in 1927 and 1928 may reflect both the reduced opportunities for industrial employment in those years and the improved agricultural income situation.

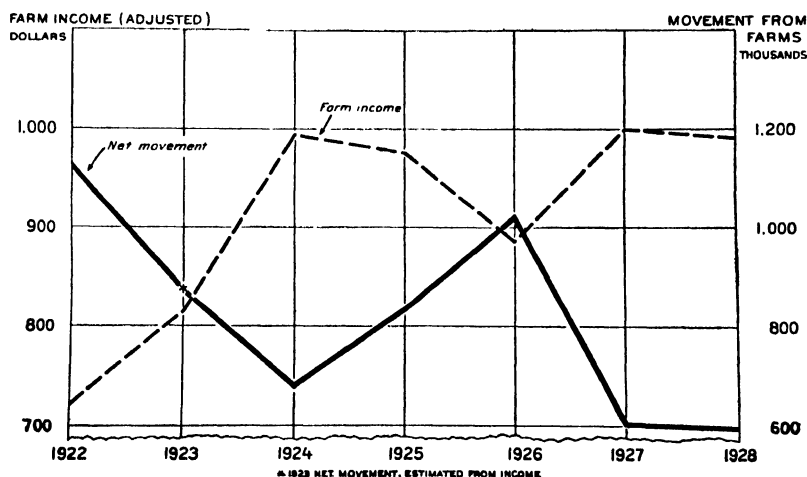


FIGURE 137.—Net movement of farm population and farm income adjusted for changes in business activity. It will be seen that during the past seven years, the cityward movement exceeded the number of arrivals from cities by about 600,000 in 1927 and 1928, and by over 1,000,000 in 1922 and 1926. The fact that a large number of farm people have been moving to cities during the last several years is undoubtedly a result of the generally low financial returns from farming compared with industrial earnings, and the expectation of greater opportunities and better living standards. The yearly variations in this net flow reflect also the yearly variations in farm income.

In Figure 137, the net movement from farms is compared with farm incomes, which have been adjusted for the variations in business activity (income divided by index of business activity). The effect of yearly variations in farm income (excluding the effect of industrial conditions) on the yearly losses in farm population is unmistakable. In addition to the year-to-year inverse relationship, there appears to be a reflection of the recent upward trend in farm incomes in the downward trend in the net farm-population movement.

The facts are of interest not only because they show in specific terms that farmers have been moving to industrial centers because farm earnings have not been satisfactory, the rate of movement being slower in years of improved farm returns, but also because they demonstrate one of the many interrelationships between agriculture and business. Population shifts from farm to cities and their causes are factors to be taken into account in plans for industrial stability. Similarly, plans for agricultural stability need to take into account the movement of city population to farms. In years of business recessions,

those who seek employment on farms undoubtedly tend first to reduce the domestic demand for some farm products, and then to increase the supply of farm labor, and probably farm production. Figure 138

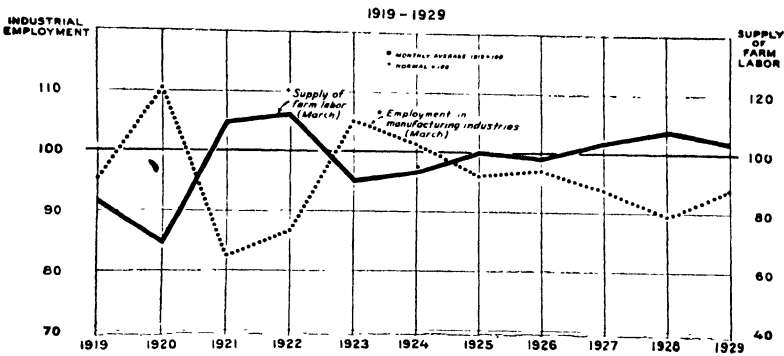


FIGURE 138.—Supply of farm labor and industrial employment

indicates clearly the inverse relation between industrial employment and the supply of farm labor.

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PORK Firmness is Modified by Feed and Other Factors

Firmness of pork is a characteristic of much concern to the hog producer, meat packer, retail dealer, and the consumer. The proportion of fat to lean, its tenderness, flavor, and other characteristics are likewise important, but firmness stands in the front rank. Pork lacking this quality usually suffers discrimination in trade channels.

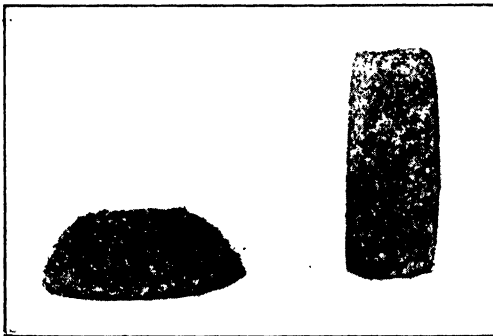


FIGURE 139.—Sausage from oily (left) and firm (right) carcasses. Both kinds of sausage were molded into the form shown by that from the firm carcass. It held its form while the oily sausage slumped down

Research conducted by the department and a number of cooperating State experiment stations during recent years has thrown much light on the factors responsible for variations in firmness. The firmness of a hog carcass and its products depends almost entirely on that of the fat. Thus the factors that influence the character and quantity of fat in the carcass deserve special

attention. Feed is the most important factor involved. More specifically, the fat or oil of the feed is usually the constituent causing softness in the hog carcass.

Among the feeds recognized as causing softness in pork, soybeans are believed to be the most important in the United States, because of their extensive production and use in hog feeding. The fat or oil of

soybeans is distinctly softening. When 25 per cent or more of soybeans is fed with corn to fattening hogs the hogs are usually quite soft. In fact, considerably smaller proportions of soy beans often result in lack of firmness. Experiments completed recently showed that 1 part of soybeans fed with as much as 12 parts of corn (or 7.7 per cent of soybeans in a corn-soybean ration supplemented by minerals) to fattening hogs had a definite tendency to produce soft carcasses when the initial weights of the pigs were 100 pounds or less and the daily gain did not exceed 1 pound. When the pigs weighed more than 100 pounds at the beginning and gained 1.3 pounds or more per day on this same feed combination, most of the carcasses were firm.

Striking Variations in Firmness

Finishing hogs on corn and soybeans, grown together and hogged down, has become a common practice in some sections of the country. Research shows that a wide variation in firmness is produced under this plan of finishing, whether supplementary minerals are fed or not. Table 16 gives a partial summary of the results obtained from hogging down corn and soybeans. More than 700 hogs were used in these experiments, and the feeding period in most cases was approximately eight weeks.

TABLE 16. —Results obtained from hogging down corn and soybeans

| Initial weight (pounds) | Average daily gain (pounds) | Firm carcasses (per cent) |
|-------------------------|-----------------------------|---------------------------|
| 125 or more | 1.5 or more | 70.3 |
| Do. | 1.4 or less | 49.3 |
| 111-124 | 1.5 or more | 69.9 |
| Do. | 1.4 or less | 27.0 |
| 110 or less | 1.5 or more | 59.9 |
| Do. | 1.4 or less | 19.6 |



FIGURE 140. —Fresh bacon from oily and firm carcasses

As with the dry-lot feeding of corn and soybeans in the proportion of 12 to 1, initial weight of the hogs and rate of gain were important factors also when the two feeds were hogged down. In interpreting these results one should bear in mind that, in general, higher final weights and degrees of finish accompanied the higher initial weights and daily gains. The former are recognized, therefore, with the latter two as factors related to the variation in firmness of carcasses. The feeding of minerals in the corn-soybean ration, in many experiments,

resulted in more rapid and greater gains and to that extent aided in producing the firmer hogs.

Among the feeds in common use in the United States the one possessing the most pronounced softening tendency is peanuts. This feed is not so widely used as soybeans but it plays a very important part in hog production in certain sections of the country. When fed, peanuts usually comprise the basal or principal feed in the ration. This and the further fact that they contain a large percentage of fat or oil—about 45 per cent in the kernel, which is the part consumed by the hog—make the decided, softening effect of the feed easily understood. When hogs are grown or fattened on peanuts, with or without protein and mineral supplements, a high degree of softness develops in the carcasses. In the case of hogs making large gains, the carcasses pass the stage of mere softness and become oily.

Softness From Peanut Feeding Difficult to Overcome

How to harden hogs which were partly finished on a peanut ration has been a problem for many years. Results of recent experiments have shown that this hardening is difficult to bring about. For example, pigs weighing approximately 100 pounds at the beginning of the test and gaining 40 pounds or more on peanut rations have rarely produced firm carcasses even though subsequently gaining 120 pounds on a feed of corn with tankage and minerals. More recent experiments have indicated the advantage of starting and finishing the peanut feeding at lighter weights and of using other feeds in the hardening ration.

Brewers' rice, one of the recognized classes of milled rice, has shown exceptional qualities for producing firm carcasses. In this respect it clearly surpasses corn, which is the standard hardening feed in the United States. Brewers' rice is classed as a basal or principal feed for use in the hog ration. Its composition is characterized by low fat and high carbohydrate percentages. On the other hand, rice polish and rice bran have proved to be softening feeds. Both are used as basal feeds and contain moderately high percentages of fat. However, the hardening requirements of hogs partly finished on rice-polish or rice-bran rations are not so extreme as are those of hogs partly finished on peanut rations.

Mention has been made of certain other factors, in addition to feed, namely, initial weight, rate of gain, final weight, and degree of finish. To these may be added the type of the hog. As previously indicated, softer grades of carcasses are associated with the lower initial weights. This is true with softening, intermediate, and hardening rations when the pigs have previously received no softening feeds. On the contrary, when 50-pound and 100-pound pigs gain 40 pounds on a peanut ration, followed by 120 pounds gain on a corn ration, results have shown that the lighter weight pigs will be somewhat firmer when slaughtered. Under such conditions the lower initial weights lead to greater firmness.

Rate of gain is a very important factor under some conditions. It is especially so with intermediate rations. In fact, except with distinctly softening rations, the more rapid gains generally lead to the firmer grades of carcasses.

Interrelation of Feed and Other Factors

Final weight is an index of degree of finish when dealing with a known type of hog and when the growth and fattening of the animal have been normal. The two must be considered together in a study of factors related to firmness of carcass. Of course, final weight varies directly with initial weight when the total gain is constant and with total gain when initial weight does not vary. There is an interrelation of feed and these other factors which must be kept in mind to understand the result in any particular instance. When hogs are grown and finished on rations of normal hardening character, firmness varies directly with final weight or degree of finish. When distinctly softening rations are fed the greater the gain and final weight the softer the carcass. With intermediate rations final weight appears to be of less importance than initial weight and rate of gain, particularly the latter, provided the hogs reach at least a moderately high degree of finish.

At any given weight, small-type hogs normally show the highest degree of finish, medium-type hogs next, and large-type the lowest. On a common ration, such as corn with nonsoftening supplements, firmness varies with degree of finish. Thus there is a definite relation between type and firmness.

In view of the commercial importance of these results progressive producers should find it profitable to keep informed on further developments in this field of study.

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POTASH Development in United States Requires By-product Utilization

The rapid progress now being made in the development of America's potash industry invites speculation as to the future of this industry, and particularly as to the maintenance of this present rate of growth.

American production of potash salts in 1928 amounted to 104,000 short tons, an increase of 36 per cent over that of 1927. This tonnage was the output of two principal producers, who manufactured, respectively, 90 per cent and 10 per cent of the total, utilizing as raw materials natural potash—borax brines and distillery waste, respectively. The increase noted was due to developments within the larger of these two plants.

From the foregoing it would appear that potash activities in their more aggressive and spectacular aspects are restricted to one enterprise; and on this basis the further statement may be justified that present progress is dependent on the exploitation of a single potash raw material.

Despite this progress, importations of potash salts from Germany and France in 1928 amounted to 976,000 tons, of a value of \$22,520,000. This tonnage represents an increase of 34 per cent over importations in 1927. Here is represented the present American market for potash salts, a total of 1,080,000 tons, of which 20 per cent (in terms of actual potash content) is supplied by American industry. The question arises, with this market available, why is it not entirely supplied with potash from domestic sources instead of continuing to be dependent on foreign sources for this agricultural and industrial essential? Both

of the raw materials, the basis of the present American industry, are capable of much more extensive exploitation. Why is the industry not immediately expanded, therefore, to meet the demands of the American market?

Elaborate Processing Necessary

The answer is to be found in the fact that potash for liberal use in agriculture must be cheap, by which is meant its manufacturing and transportation costs must be low. Potash as it occurs in nature is always combined with other elements and compounds, constituting mixtures of which the potash is rarely over 10 per cent and generally much less. Before it can be transported economically it must be concentrated, for its price is based on its concentration, while its transportation cost is based on its total weight. In its raw state, therefore, it must be subjected to more or less elaborate chemical processing to convert it into a more concentrated form and in most instances to rid it of other ingredients and combinations, which detract from, if they do not completely nullify, its plant-food value. This processing represents costs which, if it is to be sold at a low price, the potash alone can not bear. Accordingly, other products must be produced concurrently to share the cost of manufacture, and it may easily happen that it is the limited market for these necessary side products that determines the extent to which a given potash raw material can be economically exploited.

The solution of the American potash problem may, therefore, lie not in the further development of industries already established, but in the exploitation of raw materials not yet under commercial development.

From this viewpoint American potash reserves are enormous in extent and fortunately are widely distributed with respect to agricultural areas, so that the potash produced therefrom can be delivered to the farms in the contiguous territories at moderate costs as compared with the present costs of bringing potash from the German-French mines for distribution over the United States. This is a cost, now borne by the American farmer, which must be radically reduced.

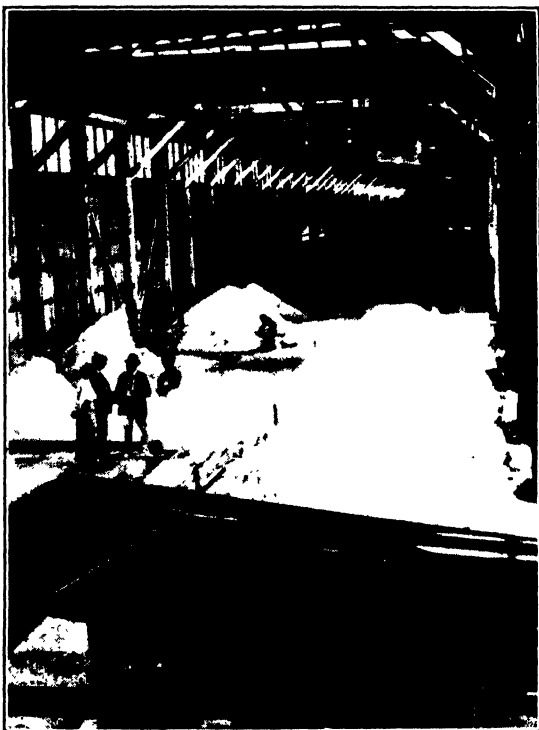


FIGURE 141.—Crystallizing house in American potash plant

Conspicuous among these reserves may be mentioned Searles Lake, Calif., now under successful exploitation, as mentioned above, containing 20,000,000 tons actual potash (K_2O); the greensand deposits of New Jersey, Delaware, and Maryland, containing in excess of 260,000,000 tons; the leucite deposits of Wyoming, containing 200,000,000 tons; the potash shales of Georgia and other States, enormous in extent, containing an amount of potash which has not been estimated; the potash brines of Nebraska, containing 250,000 tons; the alunite of Utah, containing 500,000 tons; the potash brines of Utah, whose occurrence is too widespread to admit of accurate estimation, and the extensive saline deposits underlying large areas in northwest Texas and eastern New Mexico, now under exploration by Governmental agencies.

Industrial Wastes That Carry Potash

In addition to these natural deposits there are certain industrial wastes carrying important percentages of potash, which are now being produced in quantities aggregately very large, but which for the most part are now being thrown away and irreparably lost. Conspicuous

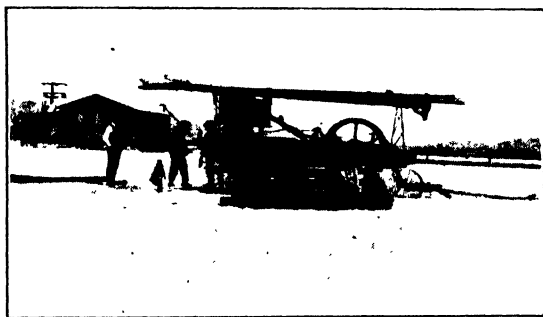


FIGURE 142.—Pump house and drill in potash plant

among these are cement dust, 85,000 tons (K_2O) a year; blast-furnace dust, 84,000 tons a year; beet-sugar (Steffins) waste, 16,000 tons a year; and distillery waste, 140,000 tons a year.

Since American consumption of potash at present is at the rate of 330,000 tons a year, it is apparent that these reserves are adequate for

future demands of agriculture for a great many years to come and at a greatly increased rate of consumption. What the situation requires is the development of various chemical processes applicable to these various raw materials for the production of by-products and of sufficiently large markets for these to provide for increasing potash production. The foundation in chemical data is now being laid by chemical research.

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POTATO Yields Per Acre Can be Much Increased With Economic Efficiency

The potato industry faced a most trying ordeal in 1928, and the growers in many commercial potato-production centers experienced serious financial losses as a result of overproduction, with consequent low prices. On this account it would seem especially appropriate to consider seriously the future outlook of this valuable industry. The question confronting the grower is that of deciding whether in the face of low prices it is possible to produce potatoes without incurring a

financial loss. In other words, can production costs be reduced to a point where it is possible to break even or to make a small profit at such low prices as those that prevailed throughout the crop-marketing season of 1928?

There is a growing realization on the part of progressive agriculturists that the business of farming must ultimately be conducted on the same basis as any other industry. The business principles considered necessary to the success of any manufacturing industry as far as possible must be adopted in crop production. What is needed in the potato industry is a considerably reduced acreage and a greatly increased production per acre. Instead of producing an average of about 116.6 bushels per acre during the years 1924 to 1928, the United States should be producing 200 or more bushels. To increase the average acreage production by more than 71 per cent may seem like an impossible undertaking and certainly not one to be accomplished overnight. However, when it is realized that certain growers in California and at least one in Colorado within the past three or four years have succeeded in producing yields of more than 1,000 bushels per acre, the task does not appear so difficult.

Influence of Potato Clubs

One of the most important recent influences bearing upon increased production per acre is that of the 300, 400, and 600 bushels per acre potato clubs that have come into existence in a number of States. The desire to become a member and to retain membership in these clubs has led to the adoption of up-to-date cultural practices, and, what is still more important, it has furnished abundant evidence of the possibility of producing potatoes at a greatly lessened cost per bushel. In other words, it has confirmed the statement that the problem of cutting the cost of producing a bushel or a hundredweight of potatoes resolves itself into increasing the yield per acre with a minimum expenditure of labor and capital consistent with good farm practice.

At present it probably costs the average potato grower approximately 75 cents to produce a bushel of potatoes. Compare this cost figure with that of 52 growers enrolled in the Ohio "400-bushel potato-club contest" in 1928.¹² The average yield per acre varied from 426 to 57 bushels, and the cost of growing a bushel of potatoes varied from 32 cents to \$2.38. The low-cost producer was second highest in average yield per acre, whereas the high-cost man had the lowest acre yield. Further analysis of the data showed that growers producing 350 bushels per acre did so at an average cost of 34.9 cents per bushel. Those whose yields were between 300 and 350 bushels per acre had an average cost of 43.3 cents per bushel. Growers whose yields fell between 250 and 300 bushels had an average cost of 49.6 cents per bushel, whereas the cost to those producing between 200 and 250 bushels was 59.2 cents; the cost to those producing between 150 and 200 bushels was 75.1 cents, while the cost of producing from 150 to 200 bushels was 89.4 cents. The production cost of the four farmers whose yields were less than 100 bushels per acre (from a total of 37 acres) was \$1.74 per bushel.

¹² MILLER, GUY. VARIATION IN COST OF GROWING OHIO POTATOES IN 1928. Proc. 14th Ann. Meeting Ohio Veg. Growers Assoc., 1929, p. 21-23.

Records of 43 Pennsylvania Farmers

The records kept by 43 Pennsylvania potato farmers in 1927, as published by the Pennsylvania State College and Agricultural Experiment Station, show that the cost per bushel varied from 29 cents to \$1.57. The data further show that 32 per cent of the farmers produced potatoes for less than 50 cents per bushel, and 49 per cent of them for less than 60 cents.

It is apparent from the foregoing data that there is a wide variation in the cost of producing a bushel of potatoes, and it is equally clear that those who had the lowest cost are the ones who are the most likely to survive financially. It is not possible to enter into any general discussion of the reasons for the widespread variation in these cost figures, but it is quite obvious that economic efficiency must have played an important part in obtaining increased yields at a lower unit cost.

The experience of many growers and potato specialists has developed certain practices which if carefully followed will lower production costs and make profits from the crop more nearly certain. In presenting the following seven practices it is not assumed that they are the only ones, but rather that they are the more important factors in the production of a large yield. These are: (1) A suitable potato soil and crop rotation; (2) the proper plowing and fitting of the land; (3) an abundance of available plant food; (4) good seed of a suitable variety generously used; (5) good tillage of the crop; (6) proper protection of the plants from crop pests; and (7) careful harvesting and handling of the crop. Space does not permit of a discussion of their importance. It will suffice to consider the items of greater efficiency in the conduct of the various mechanical operations involved in the growing of the crop.

Mechanical Aids in Growing Potatoes

The old-time method of plowing the land with a pair of horses and a man-held 1-furrow walking plow is rapidly being supplanted by a tractor-drawn plow that turns two, three, or more 12, 14, or 16 inch furrows and that is provided with sufficient tractive power to plow the land to a depth of 12 or more inches if desired. Economic efficiency reduces the cost of plowing and also reduces the cost of preparing the seed bed, because the same power can be applied to a cutaway disk and harrow two or three times the width of the ordinary 2-horse implements. The tendency to speed up has resulted in the use of 2, 3, and 4 row tractor-drawn planters and cultivators, and these same practices are also being applied to the spraying of the crop. The same thing is true with respect to harvesting. The tractor is gradually replacing the horse in hauling the elevator digger, as shown by the use of 2 and 3 row diggers. The mechanization of farming operations has reached the point in some instances where the horse has been completely displaced by tractor-drawn or motorized farm implements. It is easily conceivable that where large-scale operations are possible, production costs, at least so far as man and horse labor are concerned, may be considerably reduced. The commercial potato grower of the future must therefore be ready to adapt himself to changing economic conditions. It will become increasingly more difficult for the inefficient grower to compete successfully with the efficient one. A low cost of production should be the goal of every commercial potato producer.

The San Luis Valley, Colo., potato grower who in 1928 produced 1,047 bushels of potatoes on a 5-year-old alfalfa sod which was plowed to a depth of 14 inches and which received only two cultivations after the plants emerged, has little to fear from a competitor growing only yields of 116.6 bushels per acre.

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POULTRY Feeds Should Be Chosen for Protein Minerals and Vitamins

In formulating rations for farm animals, consideration for many years was given chiefly to the total digestible nutrients and total crude protein in the ration. As knowledge gained from experiments increased, it became apparent that the total of digestible nutrients was not so important as the total net energy, because all the digested material is not available for maintenance and growth, or for maintenance and production of fat, milk, or eggs. It was learned also that the quality, as well as the quantity, of the protein has to be considered.

Yet even when rations were prepared with due regard to the net energy and the quality and quantity of the protein, many cases were observed in which rations formulated along these lines were inadequate. Then came the discovery of the vitamins, quickly followed by an appreciation of the fact that the inorganic part of the diet likewise is highly important.

Along with this growth of knowledge regarding the facts and principles of animal nutrition there has grown, but perhaps more slowly, an appreciation of the need of keeping the animals in sanitary quarters. The value of sanitation has been repeatedly demonstrated, especially in the case of poultry. Good feed alone is not sufficient for the production of strong, healthy birds; it is necessary also to keep them reasonably free from all external and internal parasites, and from disease.

So long as it is a rather general practice to keep some feed before the growing chicks and the laying stock at all times, one need not be greatly concerned with the net energy content of rations; feeding is now not so much a question of enough energy as a question of enough well-balanced protein, an adequate supply of the necessary vitamins, and sufficient inorganic compounds.

Feed Requirements Change as Chick Develops

If rapid growth is desired, relatively large amounts of protein must be fed. A chick's maintenance requirement is very small in comparison with its growth requirement but increases with age. Hence it is clear that the feed consumed during the first few weeks must be rich in protein and that, as the chick approaches maturity, its feed should contain relatively more carbohydrates and fats. Rapid growth may be obtained on diets containing, for the first three or four weeks, from 20 to 25 per cent of protein of good quality, and for the next five or six weeks, 16 to 20 per cent. For egg production, such high levels are not necessary, but quality of protein is, perhaps, just as important here as it is for growth. Chickens bred for high egg production can get along very well on diets containing 16 to 18 per

cent protein, if it is of good quality. Diets of high-protein content apparently have a tendency to stimulate egg production, but protein is an expensive nutrient and, therefore, economical production of eggs is not always obtained by feeding diets of high protein content.

The proteins, alone, are unable to supply the nutritive needs of the growing chick or the egg-producing fowl; there still is need for the vitamins and the minerals, or inorganic portion of the diet. It is true that there may be other essentials, but in the usual diets these other essentials, if such there are, accompany the other ingredients of the diet.

Sources of Essential Vitamins

According to our present knowledge, vitamins A, B (the complex), and D are the only ones to which special attention must be given in the feeding of chickens. Vitamin C is generally supposed not to be required in avian nutrition. As for vitamin E, it is probably essential, but the usual diet is likely to contain a sufficient amount.

For supplying vitamin A in the feeding of poultry, yellow corn is especially valuable since it, at the same time, supplies an appreciable amount of vitamin B. Alfalfa is also considered as an excellent source of vitamin A; in fact most legumes are fairly good sources of this factor. Although in poultry feeding cod-liver oil is usually used as a source of vitamin D, it may have also, depending upon its source, a rather large amount of vitamin A.

Good sources of vitamin B (the complex) are wheat and most wheat products, corn, oats, and barley. Most of the root crops are also fair sources of this vitamin. One of the very best sources is yeast.

At present, the best source of vitamin D for poultry feeding is cod-liver oil. Sunlight supplies this factor indirectly, and where the birds receive an abundance of direct sunshine, no other source of vitamin D should be necessary. Various forms of ultra-violet ray apparatus may be used for supplying this factor.

Vitamin E is widely distributed in foods and feeding stuffs and, therefore, it is not likely that the average diet will be deficient in this factor. Very excellent sources of this vitamin are wheat germs and the oil obtained from wheat germs.

Products That Supply Mineral Requirements

A large number of inorganic materials are needed for growth and egg production. Those required in largest amounts are calcium and phosphorus, and to a somewhat lesser extent, sodium, chlorine, and potassium. Sulphur, iodine, iron, copper, fluorine, silicon, and magnesium are required in small amounts, and possibly manganese and zinc also. Bone and bone ash in their various forms are both excellent sources of calcium and phosphorus, especially of the latter. Oyster shells and limestone of high lime content are among the best sources of calcium. Sodium and chlorine are easily supplied as ordinary salt. The other necessary elements are generally present in adequate amounts in the feed, although at times it may be necessary to feed additional iodine and sulphur. The former is best supplied as "iodized" salt and the latter as flowers of sulphur, sodium sulphate, and calcium sulphate. Until more definite information is available, it

would not be wise to have more than 0.5 per cent of iodized salt, sodium sulphate, or calcium sulphate in the diet.

Thus, at the present state of knowledge, profitable poultry feeding is largely a matter of proteins, minerals, and vitamins. It necessitates a knowledge of the feed requirements of chickens for growth and for egg production, an intimate acquaintance with the composition and special properties of feeding stuffs, and an appreciation of the need of sanitary quarters.

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POULTRY Inbreeding, if Practiced too Closely, is Found to be Harmful. A great deal of inbreeding work has been conducted with the larger animals, and the general impression prevails that a certain amount of inbreeding is necessary to fix desirable characters. Comparatively little inbreeding work has been carried on with poultry, and but few results have been obtained to show the effects of inbreeding on various factors. Of these factors, one of the first to be affected by inbreeding in poultry is hatchability. Experiments have been conducted, therefore, to determine what effect close inbreeding may have on the hatchability of eggs as well as on other characters.

This study is important for several reasons. One is the possibility of improving hatching quality and conditions of incubation. Another is the possibility that factors affecting hatchability may also affect other problems of economic importance. For instance, nutritional factors affecting hatchability may also affect egg production, or a diseased ovary may affect both hatchability and egg production. Nutritional factors affecting either egg production or the character of the egg may also affect hatchability, as in the case of a disturbed calcium-phosphorus balance or feeding hens to produce light-colored yolks.

Previous Experimental Work

Moreover, factors affecting hatchability may be definitely correlated with factors affecting constitutional vigor and longevity in the breeding stock, or vice versa. All of the factors mentioned may be affected by inbreeding, and certainly those that affect hatchability have a far greater significance than is indicated by the meager literature dealing with the problem.

The effects on hatchability of inbreeding and outbreeding have been determined by only a few workers, but so far as the writer is aware no attempts, other than those described here, have been made to compare hatchability results from full-brother-and-sister with those from half-brother-and-sister matings.

Cole and Halpin, at the Wisconsin experiment station, inbred Rhode Island Red brothers and sisters for four years and observed a marked decline in vigor to such an extent that in the fourth year hatchability was so low that the experiment had to be discontinued. The basis of selecting the full sisters and brothers each year was on the color of the plumage of the back, other characters, such as constitu-

tional vigor and egg production, not being considered. Another inbreeding experiment was begun with Rhode Island Reds, in which full brothers and sisters were selected each year on the basis of the hatchability of the eggs and the livability of the chicks, these two characters having been assumed to be a measure of constitutional vigor of the parent stock. It is stated that the general vitality of the stock was raised but egg production decreased, which may have been due to the fact that egg production was not taken into consideration in selecting the breeders each year.

Results From Inbreeding Leghorns

Dunn, at the Rhode Island experiment station, reports the results secured in inbreeding six lines of White Leghorns, in which case the basis of selection each year was the number of full sisters available for mating on February 1 of the pullet year. At that time the group was chosen which had the largest number of full sisters and at least two full brothers, one for mating and one for reserve. The results obtained by Dunn show that hatchability decreased materially from the first to the second year in the inbred lines, and that thereafter there was a decrease each year.

Pearl and Surface, of the Maine experiment station, crossed Barred Plymouth Rocks with Cornish and observed an increase in hatchability over that of each breed. Warren at the Kansas experiment station crossed White Leghorns with Jersey Black Giants and also observed an increase in hatchability over that of either parental breed.

In order to study the matter further, work was undertaken at the United States Animal Husbandry Experiment Farm, Beltsville, Md., to determine the effects of such close inbreeding as full-brother-and-sister mating and half-brother-and-sister mating on hatchability. For each of the years the hatching period extended from March 17 to the last week in April; the eggs were incubated under as uniform conditions as possible throughout each hatching season and from year to year. The data analyzed involved hatching results from 515 individual matings, each of which produced 10 or more fertile eggs.

Inbreeding Increases Embryo Mortality

The general conclusions indicate that full-brother-and-sister matings and half-brother-and-sister matings tend to decrease hatchability by increasing the percentage of embryos dying during incubation.

Such close inbreeding affects embryo mortality from the eighteenth to the twenty-first days of incubation to a greater extent than embryo mortality from the first to the seventeenth days of incubation.

Hatchability results are affected to a greater extent in the first year of inbreeding than in successive years, though there is a general decline in hatching results each year that such close inbreeding is continued.

There is no appreciable difference in the hatchability resulting from the two kinds of mating, although the adverse affect of inbreeding was slightly greater in the full-brother-and-sister matings.

MORLEY A. JULL,
Senior Poultry Husbandmen, Bureau of Animal Industry.

POUSTRY Production Is Increased Materially by Battery Brooding

Commercial poultry farming has developed tremendously since 1885, when artificial brooders were first used in the United States. Various types of brooding systems have been used, all of which tended to increase the production of poultry. These types include the hot-water-pipe brooders in long brooder houses, used extensively for the raising of ducks, and also for winter-broiler raising, and the colony stove brooders used generally for reproducing the commercial flocks and many of the farm flocks of the country. The battery system of brooding has more recently been taken up and its use has grown rapidly in the last two years.

Battery brooders were first developed as a result of the rapid growth of the baby-chick industry and were merely wire-bottom shipping boxes used for holding surplus baby chicks until these were sold. Chicks lived so well in these simple boxes that brooding equipment arranged in a battery form was developed for raising chicks. Meanwhile feeding experiments had shown that chicks could be raised successfully indoors for weeks, provided certain vitamins were fed in their rations. Chicks fed for rapid growth were raised successfully to broiler size in these coops, arranged in from four to six tiers and kept at a suitable temperature. Somewhat similar batteries with wire floors have been used for many years in commercial fattening stations for fattening chickens which are well beyond the brooding stage. The Department of Agriculture is using the principles involved in battery brooding as well as some of the small individual brooder units in nutritional and parasitic studies at the United States Animal Husbandry Experiment Farm, Beltsville, Md.

Numerous types of batteries have been manufactured for the battery brooding of chickens. Both individual (fig. 143) and long tiers of batteries are used. Some are arranged with individual heating devices while others, without individual heat, are kept in a heated room. Various kinds of heat are used in these batteries, electricity and hot water being most common. From 60 to 100 baby chicks are put into each compartment, and from one-fourth to one-third of this number can be raised to broiler age there; the remainder need to be transferred to other batteries or put on range as the chicks grow and require more room. Some poultry raisers are using very extensive equipment of this type, brooding several thousand broilers in one room at one time.

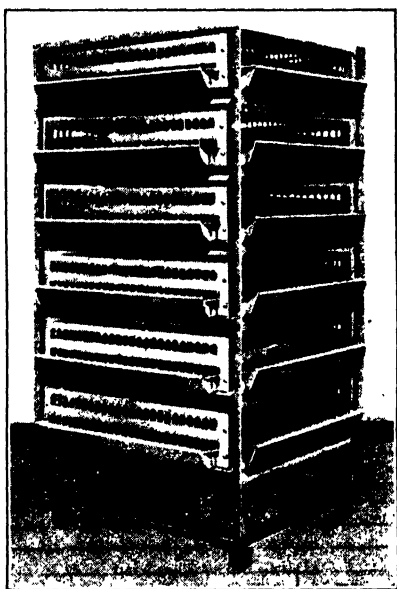


FIGURE 143. —One type of individual battery brooder

These battery brooders are usually of metal, with floors of $\frac{1}{2}$ -inch-mesh hardware cloth or wire which permits the droppings to go through to the pan placed under each unit. Feeding and watering troughs are attached to the front of each coop. The wires or openings in the front of each compartment are arranged so that the chickens can get at the feed and water freely, and removable fronts adapted to the size of the chickens are usually provided. Commercial batteries are generally used for this purpose, although some poultry farms are equipped with homemade batteries.

Advantages Claimed for the System

The advantages claimed for the use of battery brooders are less disease in the rearing of the chicks, saving of brooder space, reduced labor costs, and operation independent of the season of the year and weather conditions. There is also a material saving in fuel. Remarkable results have been achieved in the use of battery brooders in overcoming common losses from certain diseases and parasites. Since the chickens can not pick at their droppings in these batteries, diseases which have been spread through the droppings and on the ground are much more easily controlled. Such diseases, especially coccidiosis, have been the cause of tremendous losses in young chicks brooded on solid floors with outside yards.

The saving of space is apparent, as a large number of batteries may be kept in one room. Even temperatures are easily maintained, and outside weather conditions become of relatively less importance where the chickens are brooded indoors. Chicks may be brooded at any season of the year, and the cost of the chicks and the market for the broilers are the factors which influence the time of operation more than the weather conditions. Battery brooders are planned for the convenience of the operator, and large numbers of chicks can be cared for in a short space of time in these coops. The chicks are in small groups so that any sick or dead chickens are readily seen, and there is little chance for the crowding, which is often a serious problem in larger broods of chicks.

Ration Must Include Cod-Liver Oil

Feeding becomes an extremely important factor in battery brooding, since the chicks get only the feed which is supplied and have no chance to balance their ration with green feed, minerals, and insects usually picked up on range. The chicks are fed all-mash rations which must include minerals, milk, and some substitute for green feed, such as alfalfa meal. Cod-liver oil must be included in this ration, and 1 per cent of oil in the mash is recommended. The use of the oil prevents the leg weakness caused by lack of vitamin D and sunlight. The department has secured excellent growth with chicks confined in brooder houses on the following all-mash ration:

| | Per cent |
|------------------------|----------|
| Yellow corn meal..... | 40 |
| Ground wheat..... | 22 |
| Corn gluten meal..... | 10 |
| Dried buttermilk..... | 10 |
| Meat scrap..... | 10 |
| Bone meal..... | 3 |
| Alfalfa-leaf meal..... | 2.5 |
| Yeast..... | 2 |
| Salt..... | 0.5 |

From 1 to 2 per cent of cod-liver oil is added to this feed, and mixed fresh in the ration every 10 days.

Batteries do not eliminate all of the difficulties encountered in the winter brooding of chicks, and success can be achieved only by careful attention to all details. Difficulty is frequently encountered with the chicks' picking one another, and a form of leg deformity not prevented by the feeding of cod-liver oil may be the cause of much depreciation in the value of the chicks. One group of chicks may pick one another while similar groups on the same feed will not do this. The exact reason for this cannibalism is not known, and its cure is debatable. The use of milk and green feed in the ration, the tipping of the upper beak, and the use of metal blinds on the sides and fronts of the batteries are some methods used in overcoming this vice. Recent experiments indicate that there may be a vitamin deficiency which causes the leg deformity. This vitamin seems to be contained in green feed and in sour milk.

Mash is kept before the chicks all the time, but it is not advisable to feed over 14 hours a day, as the chicks may eat too much and grow too rapidly. Some poultrymen have tried keeping the room lighted all night with feed before the chicks, but this method is not advised. Chicks for broilers may be raised to market age on this one feed, except that it is advisable to omit the cod-liver oil a week or 10 days before marketing.

Temperatures Commonly Used

The temperature to use depends on the kind of batteries and the method of heating. The chicks need a temperature of about 90° to 95° F. the first week, and of about 90° the second week. It is lowered to about 85° the third week and 80° the fourth week. A temperature of about 80° should be maintained until the chickens are well feathered. Where the batteries are in a heated room and chicks are of different ages the stock may be moved down in the lower tiers as they get older, the upper tiers being kept at from 85° to 90° and the lower tiers at 80° to 85°. If the pullets are to be raised they are removed from the batteries when about 8 weeks old and put on range or raised on floors indoors. Broilers may be kept in the batteries until marketed, the number in each compartment being reduced according to the size of the chicks. Broilers raised in this manner are more tender and have softer flesh than chickens raised on range.

A high degree of sanitation is essential in this method of raising chicks. The dropping pans should be cleaned daily and the batteries kept disinfected. The feed and water troughs must be kept clean. The wire floors in each compartment aid greatly in providing sanitary quarters for the chickens. Good ventilation without drafts must be provided. The humidity in the room should be kept at from 50° to 60° F., if possible.

The best time and age to market broilers depends on the breed kept and on the market conditions. Leghorn cockerels will weigh from 1½ to 1¾ pounds at about 10 weeks; the heavier breeds are usually marketed when they weigh from 2 to 2½ pounds, which will be at from 10 to 12 weeks of age. These methods of raising chickens are adapted primarily for producing broilers when they do not compete with the regular spring crop of chickens. Highest broiler prices are usually obtained in February, March, and April; and the lowest prices

in September, October, and November. The higher prices of early spring gradually taper off but usually remain fairly good through June and into July. Prices of these broilers, fresh-killed, fluctuate more or less from year to year, and the poultryman in raising broilers has to take a chance as to what the price will be when the chickens are ready for market.

Battery brooding is also being used to some extent for raising pullets, especially on poultry farms where heavy losses have occurred in yards contaminated with disease and parasites. Batteries have been very helpful in raising pullets free from worms where the yards around the brooder houses have been infected with parasites. The pullets are usually removed from the batteries after they are well feathered and no longer need heat. They are then put on a good range, which is free from disease and parasites. A few poultrymen are raising pullets to maturity in these batteries. There is also a growing market for chickens which are old enough so that they no longer need artificial heat, and batteries may be used to supply this demand. The pullets can be sold at 8 weeks of age, after the danger period is over and put on range, while the cockerels are kept and fattened for market.

A. R. LEE,

Poultry Husbandman, Bureau of Animal Industry.

PRECOOLING Apparatus Since the first demonstration of a
Devised for Handling portable precooling plant by the
Carloads of Perishables United States Department of Agri-
culture about 20 years ago, numer-
ous attempts have been made to develop apparatus capable of pre-
cooling loaded refrigerator cars without involving the use of a large
amount of equipment. The greatest objection to the use of most of
these small portable plants has been that they were inefficient or that
they had to be applied to the car to be cooled in such a way that com-
plete car loading could not be accomplished until the apparatus was
removed. This, of course, prohibited the entire load from being
conditioned. To overcome these objections and at the same time by
means of low initial cost put precooling within the financial reach of
shippers and packers at small loading points where precooling facilities
are lacking, a simple and inexpensive apparatus and a method for
precooling car lots of perishables have been developed recently by the
Bureau of Plant Industry.

The method consists in reversing the natural air circulation within a loaded refrigerator car so that the top layers of the lading are chilled even more rapidly than the bottom layers. The apparatus necessary to accomplish this air reversal comprises two small motor-driven blowers, each capable of moving more than 1,000 cubic feet of air per minute, placed one in each ice bunker directly under the bunker hatches, with the blower discharges directed through the top bunker opening into the body of the car. By closing the top bunker openings by means of paper except immediately in front of the discharges, a reversal of air circulation within the car is obtained, so that the movement is upward through the ice, out over the top, and down through the load, thence back under the false flooring into the bottom bunker opening.

Importance of Salt Proportion

The rate of cooling of the load is dependent somewhat upon the nature and initial temperature of the lading, but mainly upon the quantity of salt mixed with the bunker ice for the purpose of accelerating the cooling. By correctly proportioning the salt, operation of the blowers for a 5 or 6 hour period will generally lower the temperature of the load to a safe carrying temperature, regardless of the initial temperature of the lading, the top layers being chilled the most rapidly. Upon removal of blowers and paper, air circulation within the car assumes its natural direction down through the ice, out through the bottom bunker openings, up through the load, and back into the top bunker opening. The bottom layers of the lading are further cooled during this process.

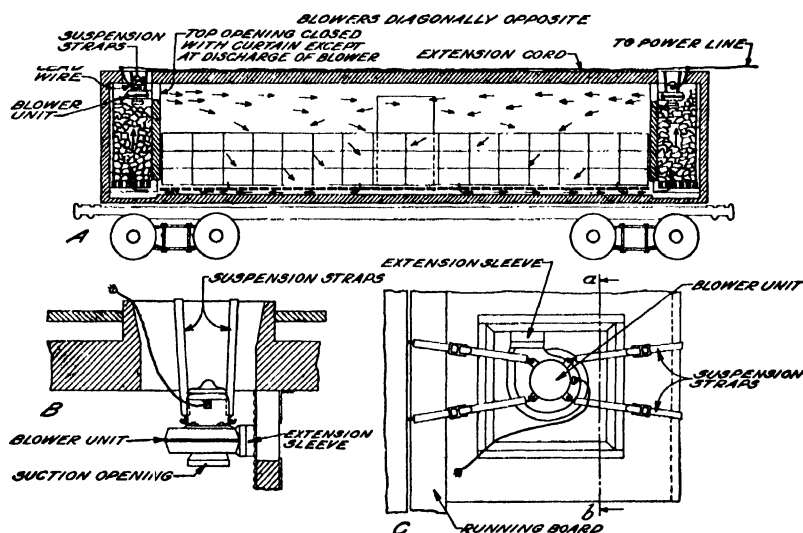


FIGURE 144.—A, Longitudinal section of a refrigerator car; B, section showing the blower in position in top of bunker and supported by the suspension straps; C, top view of hatch showing the position of the suspension straps and the blower

The equipment is small and easily handled. Each blower unit, consisting of the motor and blower, has a weight of only 85 pounds, which enables one man to move it without trouble. The $\frac{1}{2}$ -horsepower motors are of the single-phase repulsion-induction type, wound for 110 or 220 volt 60-cycle current. With this double voltage winding, power conditions in most parts of the country can be met. Each assembly is suspended under the hatch opening by means of flat, adjustable web straps which are fastened by hooks at the upper ends to the running board on top of the car on one side and under the eaves on the other side. (Fig. 144.) This method of suspension allows the hatch plugs to be replaced tightly during blower operation, thus eliminating air leaks. The strap-length adjustments allow for variations on different types of cars.

Adjustable Extensive Sleeves Used

In order to compensate for the difference in bunker widths, adjustable extension sleeves are used between the blower discharge openings

regularly to the press. To supplement the printed word, the Department of Agriculture utilizes nearly 50 per cent of all the radio stations in the United States, and many agricultural colleges broadcast regularly.

Valuable Data Not Yet Published

By no means, however, should it be felt that our educational program, in all its phases and with all its methods, has approached the ideal. There are valuable data in the colleges, experiment stations, and the United States Department of Agriculture that have not been published. Serious arrears exist in many phases of the publishing program. On large farming areas out-of-date methods of production are used. Educational work in agricultural economics by means of the printed word will obviously demand greater effort. Many farmers are not as yet reached by facts produced for the benefit of all.

No single method of carrying information to the public can supplant the other methods. Rather, each must supplement the others. Extension work supplements the college; radio supplements the press and bulletins; exhibits and motion pictures aid the program in all its phases. The purpose of all research in agriculture is to increase the knowledge of those who produce, market, grant credit, or in any other way take part in the agricultural industry. Research does not achieve results merely for classification.

The results of research to-day are greater and more accurate than formerly, and means of distributing these results are more efficient. But there is need for an increased number of competent interpreters, and coordinators, so to speak, of the data thus accumulated. Every one is thinking about agriculture now, but most people perforce do their thinking without adequate basic information. Here is an opportunity for constructive educational work. Agriculture's educational institutions might very usefully devote more time to synthesizing and popularizing their material. Interpreted data in printed form are permanent. It is not unlikely that in time every American farmer will possess bound copies of Federal and State bulletins covering his problems adequately. These will be supplemented by the more ephemeral news and interpretations carried by farm journals, newspapers, and general magazines, and by radio.

MILTON S. EISENHOWER,
Director of Information.

PRODUCE Agency Act Enforcement Reveals Improper Practices

The produce agency act has been in force three years, and the officials of the Department of Agriculture who investigate complaints under the act have learned of many practices in the produce trade that are not conducive to fair dealing with the shipper or to the establishment of satisfactory trade relations. The number of complaints filed increases steadily. The increased use of this law is evidently due to cumulative publicity and satisfactory results to shippers, through the incidental recovery of additional payments on consignments. Table 17 indicates the nature and growth of the work.

TABLE 17.—*Complaints filed under the Produce Agency Act, July 1, 1927–June 30, 1929*

| Nature of complaint | July 1, 1927 to June 30, 1928 | July 1, 1928 to June 30, 1929 | Total |
|--|-------------------------------------|-------------------------------------|-------|
| No returns received by shipper..... | 19 | 93 | 112 |
| Correctness of returns questioned..... | 66 | 124 | 190 |
| False statements alleged..... | 4 | 11 | 15 |
| Unjustifiable dumping alleged..... | 3 | 1 | 4 |
| Total..... | 92 | 229 | 321 |

The purpose of the produce agency act is to prevent dealers who receive perishable farm products in interstate commerce, on behalf of others, from making false returns or false statements to the shippers with intent to defraud, and to prevent the dumping of produce without good and sufficient cause. Violation of the act is a misdemeanor punishable by fine or imprisonment.

Most Dealers Cooperate

Most dealers give full cooperation to the Federal investigator, but sometimes cooperation is given reluctantly, as might be expected when the accounting is not likely to correspond with actual facts. Usually when discrepancies have been found, dealers have been anxious to make settlement with the consignor. Guilt is usually not difficult to detect. Few persons are able to cover all the traces of a fraudulent practice.

One dealer made a practice of soliciting consignments and reporting sales, whereas, in fact, he bought the shipment upon arrival at his own price, retained the profit of the sale, and collected a commission from the shipper. This practice is grossly unfair to the shipper. Another dealer included the standard refrigeration charge in the item of freight charges when, in fact, he shipped the produce under initial icing, thereby retaining the difference in refrigeration cost for his own use without the knowledge of the grower.

Another dealer made a practice of reconsigning shipments to other markets but made returns as if the produce had been sold in his own market. He did this by reducing the amount of gross sales to offset the additional cost for freight to the second market, and the additional commission. The shipper did not realize that he was paying an additional freight charge and two commissions and that this was the reason for his small net proceeds. Dealers have been found to cover up a brokerage or second commission by reducing the amount of the gross sales in their own market. The shipper is defrauded accordingly.

Delay in Making Remittances

Some dealers who receive many express shipments apparently do not make remittances until after frequent appeals from the shipper and in some instances not even then. In a case investigated the accounting rendered was greatly below the actual sale prices. On the other hand, some shippers consign produce unsolicited, fail to show their names and addresses on express shipments, and send no notice of shipment.

A dealer overstated the freight charges and understated the gross receipts, thereby making a decided additional profit; another collected

loss and damage claims of substantial amounts from the railroad but retained them instead of forwarding them to the consignors.

The department investigators learn of many other subterfuges of unscrupulous dealers, such as substituting frozen or decayed produce for good produce at the car door before calling for an inspection, and rejecting a purchased car of produce on a declining market with a false statement as to its condition, and then either getting an allowance or withholding part of the proceeds in accounting for the consignment.

The shipper suffers from these dishonest practices and is not in a position to protect himself except as he may call upon the department to investigate the transaction when the produce has been handled as a consignment. He should exercise great care in selecting the person or firm to which he consigns his produce.

Wrong Practices By Shippers

Fraudulent practices are not confined to dealers in terminal markets. All shippers are not careful to grade the produce strictly; many are inclined to pack as near as possible to the minimum of the specifications. Best packages are placed nearest to the car door or the finest fruit is at the top of the barrel or box.

Reports of inspection of the shipment upon arrival furnish evidence of the condition of the produce. These reports are frequently lacking when they would be helpful in settling disputes.

The produce agency act makes no requirement as to the kind of accounts which dealers must keep. Investigators have been impressed with the variety of systems of records and with the lack of records. Some dealers have scarcely sufficient records to indicate whether they have settled for all consignments. Frequently no lot number is shown on the sales slips to identify the sale with the particular shipment and sales slips are not numbered serially. This constitutes insufficient accounting. The commission merchant is the agent of the shipper and is expected to keep such records as will show all sales from the consignment. The shipper is entitled to these details from his agent, the commission merchant, if he requests them. Sales slips and all correspondence and other papers relating to a shipment should be retained at least six months after remittance is made to the shipper.

A development of more honest practices on the part of both the shipper and the receiving dealer would improve the confidence of one in the other, remove some of the speculation in the produce trade, and give the producer a larger share in the returns from his crops.

W. L. EVANS,
*Associate Marketing Specialist,
Bureau of Agricultural Economics.*

PRUNE Production International trade in dried fruits, in recent years, has been marked by large and increasing production in the United States, with Europe as the largest factor in the purchase and consumption of supplies. The average total world production of dried prunes in recent years has been about 470,000,000 pounds. The United States supplied 75 per cent of this production. Of this total, about 50 per cent was exported to Europe. Average total world



FIGURE 145. The Yugoslavian peasant delivering prunes to the packing plant. Horses are common in Bosnia, but ox teams are used almost exclusively in Serbia. The typical peasant garb is shown in the extreme right

production of raisins, not including currants, in recent years was some 800,000,000 pounds, of which the United States supplied about 600,000,000 pounds, or approximately 75 per cent. The countries of western Europe are the greatest consumers of dried fruits.

Important factors influencing the demand for American dried fruits in principal European consuming districts are: Direct competition



FIGURE 146.—View of one of the more modern type prune-processing plants in Bosnia. These plants are usually owned and operated by corporations, the stock in which is held by large financial institutions

with dried fruits from other exporting countries and indirect competition with fresh fruits, either imported or locally grown.

Countries competing directly with the United States in prunes are France and Yugoslavia. Prune production in France has been steadily declining, with every indication that this will continue. The generally low price of prunes in postwar years has caused peasants to turn to crops that promise quicker financial returns. Yugoslavia has shown a decline since 1927 in both production and number of trees. Low prices have had a tendency to reduce the total quantities of dried prunes for export, and larger quantities are used for brandy and jam. Improved railway transportation has facilitated the shipment of fresh prunes. A heavy toll of bearing prune trees has been taken by the Schildlaus (*Lecanium corni*). Through liberal financial assistance, the Yugoslavian Government is attempting to prevent further spread of this pest. The industry is elastic in that the seedling young tree comes into production quickly and new orchards are planted at little cost.

Consumption of fruits in Europe, especially fresh fruits, has generally been on the increase, partly as a result of extensive advertising campaigns. The United States is not keeping pace in advertising.

In uniform quality and neatness of pack, products from the United States stand far above others; but, in maintenance of personal contact with the trade, this country is behind. Large consumer organizations and the chain-store movement are increasing group buying. Competing dried-fruit exporting nations are centralizing within the industry such activities as improvement of quality, advertising, and marketing. So far, little has been done by dried-fruit growers in the United States to meet this growing tendency in Europe by centralized selling.

M. J. NEWHOUSE,

Consulting Specialist, Bureau of Agricultural Economics.

PUBLICATIONS of the Department Grouped According to Purpose

Those receiving the publications of the United States Department of Agriculture may wonder why they are grouped into classes or series, and what determines how they are named. What type of bulletin is published in each series, and what are the differences? In order to get and to use to the best advantage the agricultural information published by the department, and to avoid ordering bulletins they do not want, readers should have clearly in mind the characteristics of each series. In announcements or lists of department publications they see leaflets, farmers' bulletins, technical bulletins, department bulletins, circulars, miscellaneous publications, miscellaneous circulars, and statistical bulletins, as well as others of more special nature, and may be confused because of the large number of series or classes.

In general, agricultural publications may be divided into two groups: (1) More or less technical publications, presenting the results of research for those who, by training, education, occupation, or specialty, are able to make use of such information; and (2) popular publications, giving practical information in simple terms, so that it may be readily applied. Some publications are difficult to classify for they seem to belong to neither group.

Because of the variety and range of material published by the department, and the diversity of interests among readers, the department has arranged its publications in several series.

The leaflet series, started in 1927, is the newest. Leaflets are intended to be attractive in appearance and to present material clearly and in an easily understandable form for readers who wish specific directions or concise information. The leaflets are limited to eight pages. This series is very popular.

Aside from the annual reports, farmers' bulletins constitute the oldest continuous series now published by the department. The first one was printed in 1889. This series contains popularly written material on an exceedingly wide range of subjects pertaining not only to the farm, the farm home, and rural life, but also to some problems and conditions of interest to city people. The farmers' bulletin series is undoubtedly the best known of the department's series of publications.

For many years the department published the results of its research work in a technical series called department bulletins. This name was not distinctive, and did not indicate the character of the material. Hence it was stopped at Department Bulletin 1500, and the technical bulletin series was started. As the name implies, this series carries technical material resulting from research work conducted by the department.

Material of Indeterminate Character

As previously indicated, some material is not altogether technical or popular and does not seem to belong in the leaflet, the farmers' bulletin, or the technical bulletin series. It may not present the direct results of research, or if it does, the results may be of only limited application or interest. The material may be of a special character, as a compilation of data or information gathered from many sources, published or otherwise. For this general type of material, the circular, seems well suited. In some cases a circular contains material in the nature of a preliminary report of an investigation, the later completed work being published in a technical bulletin. In other cases the material is more conclusive.

Some matter to be printed may necessitate a publication of different character from those in any of the above-mentioned series. The material may be simple or very technical, brief or extensive, much illustrated or without illustrations. It may be merely a list of employees in a bureau or in the department, or in the agricultural colleges and experiment stations. In harmony with the varied nature of such material, it has been grouped in the series called miscellaneous publications. That name describes it fairly well. Formerly this series was designated miscellaneous circulars. The change was made because the name "circular" was not sufficiently broad to include all the types of publications printed in the series.

About 30 statistical bulletins have been published. As the name implies, these bulletins contain statistics on crops, livestock, and agricultural products (cold-storage holdings, shipments, prices). Each bulletin deals with only one general subject.

In addition to these series, each of which contains publications covering a wide range of subjects, the department issues other series containing matter more restricted or special in nature. Under this class are listed the annual reports of bureau chiefs and of the Secre-

tary, inventories of seeds and plants imported, North American fauna, service and regulatory announcements, soil surveys, yearbooks, miscellaneous folders, unnumbered publications, and posters.

The Department's Periodicals

Finally there are the periodicals, each issued at regular intervals throughout the year. They cover special fields and are designed primarily to aid those engaged in certain lines of work and others who require the information. The department periodicals published this year are: Agricultural Situation, Climatological Data, Clip Sheet, Crops and Markets, Experiment Station Record, Forest Worker, Journal of Agricultural Research, Monthly Weather Review, Official Record, Public Roads, Snow and Ice Bulletin, and Weekly Weather and Crop Bulletin.

The question whether the present grouping or arrangement of department publications is the best that is possible was studied during the year. Are there too many series? Would it be better to combine some of them? Or, in view of the diversified nature of the department's work and the variety of subjects covered in its printed matter, is it desirable to have as many series as at present? This problem is still under consideration.

M. C. MERRILL,
Chief of Publications, Office of Information.

RABBIT Raising for Food and Fur Studied at Experiment Station The methods of production of domestic rabbits for food and fur now being developed at the United States Rabbit Experiment Station at Fontana, Calif., can be followed with profit by rabbit producers generally throughout the country. This experiment station was established in 1927 by the United States Department of Agriculture through the cooperation of local rabbit breeders in California and the National Rabbit Federation, and is operated by the Bureau of Biological Survey. Its primary object is to provide reliable information based upon experimentation for the benefit of all who are engaged in the rapidly growing rabbit industry. The establishment of the station fills a recognized need of breeders who are engaging in the business on an extensive scale and of farmers and others who are raising only a few animals as a side line to regular farming operations. The accomplishments at the station for the rabbit industry generally will be of help also to those who contemplate engaging in the business as well as to the younger members of farm and other families who are raising rabbits merely as a pin-money venture.

The rabbit industry has advanced, however, beyond the stage of a pet-stock business and is now an agricultural enterprise of considerable proportions throughout the country, particularly in the Pacific Coast States. In many rural sections rabbits are being produced in great numbers. In California great numbers of farmers keep a few pairs, and some raise 1,000 to 5,000 or more. To care for the products of these rabbitries large slaughterhouses are operated, equipped in some instances to handle 25,000 to 50,000 rabbits a month, particularly in the Los Angeles district. The food value of the rabbits served in the hotels and on the home tables of that city alone is estimated to be greatly in excess of \$1,000,000 annually.

Research Needed for the Industry

An industry of such proportions, to be permanent and stable, must be based on scientific research. The cost of research is good insurance on both large and small investments in rabbitries. Problems confront all rabbit raisers regarding feeding, breeding, and housing conditions, and preventing the ravages of diseases and parasites among their stock. To provide a means of solving such problems and of developing economical and efficient methods of production was the aim of the organizations and individuals who tendered their cooperation to the department in the establishment of the Rabbit Experiment Station at Fontana.

The station is on the site of a 5-acre orange grove. The equipment furnished by the cooperators includes this tract, an administration building (fig. 147) containing laboratories, offices, and assembly hall, various open and closed types of shelters for hundreds of hutches (fig. 148), which are kept cool on hot days by a sprinkler system; a large feed-storage house for hay and grain; and an attractive residence for the director and his family. The director of the station is employed by

the Bureau of Biological Survey, and reports to that bureau through its division of fur resources.

When the station was formally opened in March, 1928, there had been donated by the co-operators and others interested approximately 50 rabbits of different breeds and of various ages for use in the experiments. It was first necessary, therefore, to determine the ability of the stock at hand to produce uniform young



FIGURE 147.—Administration building of the United States Rabbit Experiment Station operated by the Bureau of Biological Survey at Fontana, Calif., to determine the best methods of producing rabbits for food and fur. The structure is of white stucco with a red tile roof

before a suitable number of rabbits could be obtained for further studies. In August, 1928, with 125 rabbits available, five major experiments in feeding for production and maintenance were inaugurated. Thirty-six rabbits were obtained to replace poor producers and thereby maintain uniformity among the various groups. In the summer of 1929 there were available for the experiments 191 mature rabbits, 113 young, and 26 rabbits of fancy breeds. From 88 breeding does on two experiments, 1,182 young had been produced, of which 762 were carried through the weaning period.

Study of Rabbit Maladies Projected

The means by which rabbits can be raised to a marketable age at minimum expense, keeping in mind the opportunities for maximum profits from both meat and fur, are subjects of special attention at the station. These ends are being attained partly through a study of the factors that reduce losses among young rabbits and increase the prolificacy of the adults. The station was enabled to render excep-

tionally valuable service to the rabbit industry in the present year, through cooperation with the Universities of Minnesota and Southern California, in studying and controlling a malady that had attained epizootic proportions among domestic rabbits. The laboratory facilities at the station were not adequate at the time to cope with the situation without the aid of research workers in other institutions. Until authentic and adequate information can be developed for controlling outbreaks of disease, the appeals to the station for help made by producers of rabbits can not be fully answered, and large investments in the business are thus in jeopardy. It is planned to expand this line of research as rapidly as facilities are provided for the purpose.

Construction work has played an important part in the development of the station. The equipment and facilities now available include 4 inclosed breeding buildings, 4 outside rabbit runs, a new open unit with a total capacity of approximately 300 individual hutches, and 8 pens. This equipment represents a wide variety in types of construction, and considerable information regarding proper housing will result from a comparison of the buildings in use.

Fertilizer Experiments Conducted

A fertilizer experiment for the purpose of establishing a market value for rabbit

manure is now being conducted by the Bureau of Biological Survey at the station, in cooperation with the Bureau of Chemistry and Soils and the county farm adviser. The results promise to be valuable not only to the development of the rabbit industry, but to fruit growers and gardeners as well.

Farm boys and girls in California have taken a keen interest in rabbits, and the director of the station has assisted agricultural extension agents in organizing 4-H rabbit clubs. Invitations have been sent to the schools of California to visit the station, and boys and

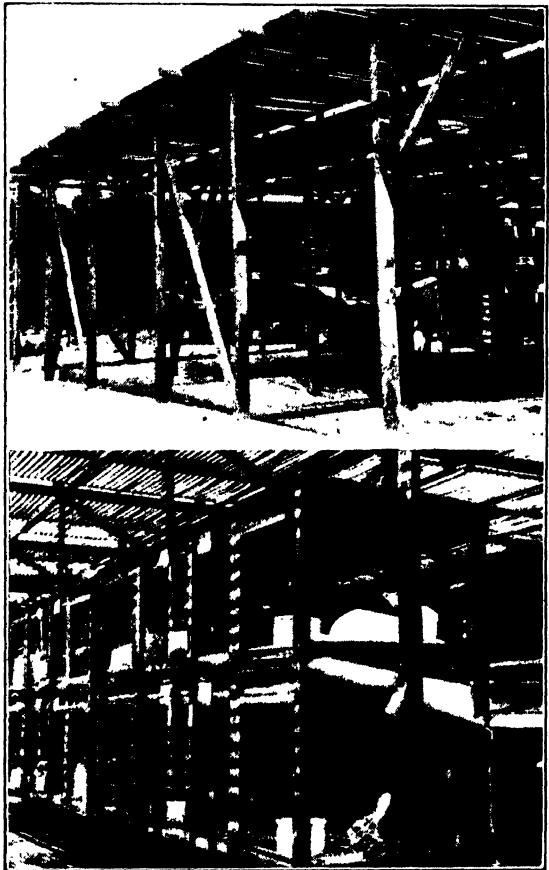


FIGURE 148.—Exterior and interior views of new type of open-air hutch unit for rabbits, used at the United States Rabbit Experiment Station, Fontana, Calif.

girls interested in 4-H club work have taken advantage of this opportunity to observe modern methods of raising rabbits for both food and fur and to learn of the profits that may be made in the industry.

FRANK G. ASHBROOK,
Principal Biologist, Bureau of Biological Survey.

RADIO Programs for Both National and Regional Use Adopted From the development of general information radio broadcasting by the United States Department of Agriculture during 1929, two particularly significant facts emerge: An expansion of the department's "chain" broadcasting program, and a move to correlate Federal and State broadcasting in cooperation with individual commercial stations. These developments may seem to be in opposite directions, but the apparent contradiction disappears in practice.

The chain program began in October, 1928, when the National Broadcasting Co. opened a network of 17 stations in the Middle West and Southwest to a 5-day-a-week program of 15 minutes from Washington. In July, 1929, the company expanded this network to 32 stations covering the country east of the Rocky Mountains, and undertook to provide entertainment and information features to balance a 45-minute program daily, except Sunday. The Federal Farm Board, the land-grant colleges and universities, and the great national farm organizations were invited to participate. This program, called the "National Farm and Home Hour," is broadcast from 12.45 to 1.30 p. m., eastern standard time (11.45 a. m. to 12.30 p. m. central standard time, and 10.45 to 11.30 a. m., mountain standard time). On Saturdays when the 4-H club, land-grant college, and farm-organization programs are sent, the Pacific coast stations of the National Broadcasting Co. are included in the network.

In this program of centralized broadcasting, which reaches an audience scattered over at least 37 States, speakers have to choose subjects having the widest possible interest. This has developed emphasis on broad economic and scientific trends. The speakers try to explain current developments in the farm-commodity markets. They summarize and interpret Federal crop and livestock reports, and give the essential new findings of research. In making seasonal reminders of approved production technic, they confine their remarks to practices which apply over wide areas. In short, the chain broadcasts are shaped to give the information that can best be given by the Federal authority. It is logical that this service should be centralized.

A Decentralized Type of Broadcasting

It is equally logical that another type of farm and home broadcasting be somewhat decentralized. This second type includes weather reports, market news, and information broadcasts in cooperation with individual radio stations. Weather and market news broadcasts have been decentralized from the beginning, and handled through the branch offices of the Weather Bureau and the Bureau of Agricultural Economics. Weather reports and market news dealing with facts of specific interest and value to the audiences of the stations are issued from these branch offices through cooperating radio stations.

In 1926, when the Radio Service of the department was organized, it was realized that farm and home information for release through

individual radio stations should have a more or less regionalized appeal. This was achieved by preparing broadcasts for five general agricultural regions. Such programs, prepared by a staff of five writers in the Radio Service, are now released through 164 cooperating radio stations.

In 1928 the Radio Service was invited by the radio committee of the Association of Land Grant Colleges and Universities (under the Smith-Lever Act of 1914, member colleges and universities of this association operate the State agricultural and home economics extension services) to cooperate in working out a system for correlating Federal and State extension broadcasting. The outcome was a proposal, submitted by the directors of extension and information of the department, for cooperation of the State extension services and the United States Department of Agriculture in releasing syndicate programs through commercial radio stations in each State. The radio committee of the association, at its annual meeting in 1929, recommended that its member institutions adopt the plan.

The proposed system as far as possible will decentralize extension broadcasting through individual radio stations. The Department of Agriculture will provide half the programs, and the States the other half. Thus duplication of Federal and State information will be avoided. In collaboration with the department, the State extension services will arrange schedules with cooperating broadcasting stations.

Pooling Information Resources

It is hoped in this way to make better use of the valuable broadcasting time offered for agricultural service by commercial radio stations. The information resources of the land-grant institutions and the Department of Agriculture will be pooled, so as to bring out the freshest and most useful information available. By December 1, 1929, the proposal had been accepted by more than half the land-grant institutions. The new system probably will be started by September 1, 1930. It is not designed to affect the work of the radio stations now operated by 19 land-grant institutions, but to provide, through the cooperation of commercial stations in those States and in the 23 others serviced by commercial stations, farm and home radio information services of maximum effectiveness.

The expansion, under Federal control, of chain broadcasting follows logically from the necessity of making interpretations of the rapidly changing agricultural situation available to farmers generally. Broadcasting under joint Federal-State control follows logically from the necessity of making available to each local group in agricultural America the specific scientific and economic facts that apply to the local problems of that group.

That the department and other agencies for agricultural improvement can send both types of information to nearly 2,000,000 radio-equipped farms is a tribute to the cooperative spirit of radio broadcasters. During 1929 the National Broadcasting Co. made available to the department, without charge, more than 100 hours of broadcasting time on each of 32 associate stations. More than 150 individual radio stations similarly gave more than 8,000 hours of broadcasting time to syndicate programs supplied by the department.

MORSE SALISBURY,
Chief, Radio Service, Office of Information.

RANGE-FORAGE Grazing Those engaged in managing range lands constantly have to decide Should Leave Fifth or the extent to which the range More of Plant Volume plants should be utilized. It is impossible to suggest to them a basis for decision that will apply to all ranges. A method can be outlined, however, that will fit most cases.

The first step is to find out what species can be perpetuated on the particular range with reasonable use and management and about how dense a ground cover can be expected. The type of soil, available moisture, temperature, and other such factors must be considered. The species that should be perpetuated can be decided upon from a study of existing conditions if the species occupying the range grow there naturally. If overgrazing, fire, or some other disturbing factor has favored the growth of the plants present on the range in place of others that would occupy it if it had been left undisturbed, then the species that occupied the range before it was abused must be determined.

The next step is to ascertain which are the better forage species. Livestock rather consistently eat certain species in preference to others. Generally, a good forage plant is relished by livestock, is nutritious, has no bad effects, grows either abundantly or to a large size, or both, so that it makes up an appreciable proportion of the forage and holds its own well in competition with other plants. If, in addition, it is a good soil binder it has added value for watershed and soil protection. It is species of this kind that should be perpetuated and, therefore, upon which the management of the range should be based. Experience and experimentation have shown that range abuses, such as too heavy grazing, or too early grazing, result in the killing out of the better forage species and the coming in of inferior species. The livestock thus get less feed, and feed of poorer quality. Often poisonous plants are among the species that replace the better forage plants. Usually, also, depleted ranges are subject to erosion and contribute to floods.

Perpetuating Desirable Species

The next question is how to manage the grazing so that better forage species will be perpetuated in a vigorous condition. Protection from too early grazing and opportunity for the plants to produce sufficient seed are important. The food used by the plants and stored in them is synthesized in the leaves. Therefore, it is essential that there be a fair amount of leafage all during the growing season. Species differ in the amount of leaves and stems they can lose and still remain vigorous. As a general rule, however, about one-fifth of the volume of the herbaceous species should be left at the end of the grazing season. If more is taken the plants will weaken and die. A few species will not endure even this degree of utilization. Blue-bunch wheat-grass (*Agropyron spicatum* or *A. inerme*), for example, apparently will not continue to do well if more than half, or at most two-thirds, of the plant volume is utilized each year. In the case of browse species, enough of the new twig growth should be left each year so that there is an average of one or two lateral buds to the twig. Heavier use results in hedged, scrubby plants with many dead limbs and twigs, and eventually in death.

Where the soil is loose, the slope steep, the range partly depleted, or where other special conditions exist, the degree of utilization must be less than that indicated above.

The most important points are to perpetuate the better forage species and leave one-fifth or more of their volume each year. If this is done one need not be concerned about the less-palatable species, for it is certain they will be unharmed. Nor need one ordinarily (very steep slopes and loose soils are exceptions) be concerned about injury to soil, watershed, or timber reproduction, for on ranges where the plants are properly utilized injury to other resources is rarely found.

ERNEST WINKLER,
Assistant District Forester, Forest Service.

RANGE Stocking Must Be Conservative to Allow for Poor Years Few things have as vital an effect on the range-cattle industry of the Southwest as the variation in yield from year to year of perennial range grasses and the consequent unevenness in the capacity of the range to support livestock. Over most of the region the native perennial grasses are the basis of the forage supply for at least a part and in many cases a very considerable part of the year. Other vegetation may serve as a supplement and occasionally is of extreme importance in times of drought; but its failure does not ordinarily cause the same degree of concern as a failure in the perennial grass crop. A study of the annual yield of perennial grasses made by the Forest Service at the Santa Rita Range Reserve in southern Arizona has proved of considerable value in pointing out the need for a strictly conservative basis of stocking if this important forage is to be maintained on the range in sufficient quantity.

The data on yield have been collected for six separate years, 1921, 1922, and 1925 to 1928, inclusive—years that averaged from fair to excellent in production. In the drought year, 1924, practically no growth was produced on the area studied. During the six years of study six important grass species on a given area showed an average high yield of 176 pounds in the best year, as compared with 52 pounds in the poorest year.

In the foothill type of range, four important grass species showed an average variation in yield on a given area of from 21 pounds per acre in a poor year up to 121 pounds in a good year. The 6-year average in the foothill type was 70 pounds; and a summarization of the data for the period showed that for three years the yield was below the average, for two years very slightly above, and for one year appreciably above.

In the mesa type, where two of the most important grasses were studied, the yield on a given area varied from 114 pounds in a poor year up to 260 pounds in a good year. The 6-year average yield in this case was 205 pounds. The yield in two of the years was very much below this average, in two slightly above, and in two appreciably above.

Individual species in both types showed generally a very much greater variation, the yield in a good year being from four to six times that in a poor year.

Conservative Stocking Essential

With such great variations in yield and no possible way of estimating them in advance, it is absolutely essential to stock the range on a strictly conservative basis. As determined and applied on the Santa Rita Range Reserve, this means a rate of stocking that will not exceed 75 per cent of the number of grown stock that an average year would indicate as proper for the range. In the case of a breeding herd, where calves are ordinarily held over to the age of yearlings, the total permissive stocking, including calves, may be as high as 85 per cent of what the range will carry in an average year, with definite provision for selling off sufficient young stock to bring it down to the 75 per cent basis at the first sign of any impending shortage of feed. Such stocking will apparently meet the ordinary years of short feed without any adjustments in numbers of cattle at all, and in the most extreme droughts will greatly minimize the number of cattle that have to be fed or removed from the range in order to provide feed for the remainder.

In the good years it may appear that a lot of feed is going to waste, but extensive study has shown that the apparent waste is more than made up by increased vigor and growth during the succeeding year and particularly so if the latter happens to be a drought year. Likewise, any surplus of forage left over at the close of a good year may be utilized in the year following if forage growth in that year happens to be either late or deficient.

MATT J. CULLEY,

Director, Santa Rita Range Reserve, Forest Service.

RANGES Are Made Usable by Hauling Water for Livestock

An adequate supply of water for livestock, whether present naturally or developed artificially, is essential to the use of any range or pasture. On the Deschutes and Ochoco National Forests, which border the "high desert" region of central Oregon, large areas of excellent summer range remained totally unused until within the past few years because they were without water for stock. The Fort Rock district of the Deschutes at lower elevations merges into a "desert," a high pumice-covered plain. Here, and on a portion of the Ochoco Forest, there is light to medium winter snowfall but no consequent water in summer. As the snow melts the water is absorbed by the loose pumice soil that overlies the porous lava rock, in some places to a depth of many hundred feet, and for miles no evidence of watercourses is found. In spite of these conditions the areas are covered for the most part with an excellent stand of mature western yellow pine averaging 14,000 board feet per acre, under which is found a luxuriant growth of secondary vegetation consisting mainly of bitter brush (*Kunzia tridentata*), Idaho fescue (*Festuca idahoensis*), June grass (*Koeleria cristata*), wheatgrass (*Agropyron spicatum*), and needle grass (*Stipa occidentalis*). Long periods of summer drought make this material highly inflammable, and the areas are subject to destructive lightning fires. For years the Forest Service has sought means of reducing the fire hazard and converting this latent grazing resource into useful animal products.

As far back as 1908 the Government experimented in drilling wells on these areas. Except in one case, the drilling was unsuccessful. A

plan was then proposed for tapping the Paulina Lakes, piping the water for some 25 miles, and distributing it over the dry territory to the south and east; but engineering difficulties made the cost prohibitive. Finally, when roads had been built for fire protection, the problem of making this large body of excellent summer range available for pasturing sheep was solved through the use of the ubiquitous truck and portable watering troughs.

In 1918 an enterprising sheepman began hauling water some 10 miles to his dry range on the Deschutes area. A year or so later water hauling was started on Dry Mountain range on the Ochoco Forest. These examples proved so successful that others followed rapidly. Out of a total area of 402,096 acres wholly unused in 1916, to-day 306,000 acres are profitably used by livestock. This water development is described in detail in unpublished reports by Assistant Forest Supervisor W. O. Harriman and Ranger E. W. Donnelly.

The water is supplied by 14 wells located in a semicircle on the borders of the area and southeast of it. The longest haul is 29 miles, the shortest 4 miles, and the average about 8 miles. Four stockmen haul all or part of their water from irrigation ditches 18 to 25 miles from their range; three are supplied from the Government well at Cabin Lake.



FIGURE 149.—Loading water from receiver tank into tank trucks at Forest Service well. This water is hauled about 10 miles and unloaded as shown in Figure 150

Equipment Used

Several different types of hauling equipment have been developed, from a 1-ton truck with a 250-gallon tank to a 3-ton truck having a 1,000-gallon tank equipped with a light centrifugal pump that is useful both for filling the tank and for emergency fire fighting. For four trucks having a tank capacity of 460 gallons each the cost averaged \$1,332.58 per truck. A set of nine metal watering troughs cost \$191.25, making the cost of the whole outfit \$1,523.83. Capitalizing this investment over a 10-year period made a cost per head per month of 15 cents. The cost of hauling was found to average 5.2 cents per head per month. On long hauls costs were as high as 9.3 cents; on hauls of 8 miles or less they were held as low as 3 cents. All normal costs to the operator are fairly covered by 18 cents per head per month. Incidentally, the trucks are used on home ranges during the winter for hauling feed and supplies; only a part of the cost, therefore, is properly chargeable to water hauling.

Heavy trucks with 1,000-gallon tanks were found ordinarily too heavy for the loose dirt roads, and stockmen generally are favoring a medium-weight truck with a tank capacity of from 300 to 450 gallons.

Such an outfit can be loaded in from three to six minutes. The galvanized-iron watering troughs generally used are 8 feet long, 14 inches deep, and 18 inches wide, and flare at the top so that they "nest" and are easy to move. Eight to twelve of these are placed near the camp.

Water hauling has converted what was once virtually a timbered desert into excellent range that supports 25,000 sheep and 3,000 cattle the summer long. Moreover, the lambs from this range weigh 71 to 93 pounds when marketed, and their fat is of firm quality. Water hauling coupled with grazing use also bids fair to solve one of the knottiest problems of fire protection found on any forest of the Northwest.

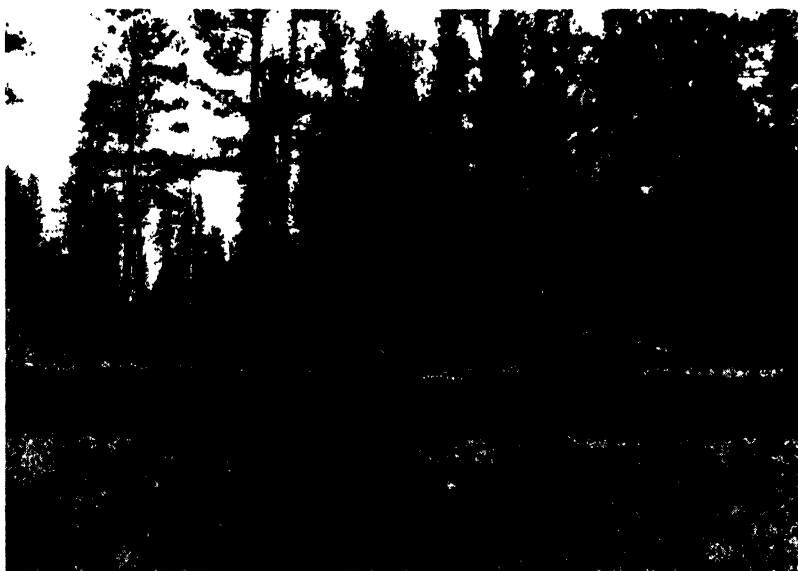


FIGURE 150.—Filling the watering troughs on the dry range while the sheep are away feeding. This area is typical of the dry range the use of which is made possible by this type of water development

Method of Watering

Cattle are watered from stationary troughs located at or near the wells, but it is customary to haul water to the sheep daily or on alternate days, and to move their watering troughs frequently. Some of the bands water at night, the filled troughs awaiting the sheep as they come into camp; the practice that appears to be best for both sheep and range, however, is noon watering, with nightly change of bed ground and consequent frequent change of watering place.

In order to save delay in filling the tank trucks it is necessary to store water at the wells. This storage is also an asset in case of forest fire, as are the sheepmen's tank trucks.

The amount of water consumed by the sheep has been found to vary widely, largely in accordance with the type of feed, weather conditions, and management of the stock. Some herders insist that their flocks require water every day, while sheep in other bands seem content and do equally well when watered every second or third day

only. Ewes with lambs ordinarily take much more water than dry sheep. Difference in requirements is illustrated in the case of one stockman with two bands using adjoining and similar range, one of 1,100 ewes with 700 lambs and one of 1,200 ewes with 1,100 lambs. The first band required 800 gallons of water per day, or 0.44 gallon per head per day; the second required 1,200 gallons, or 0.52 gallon per head per day. The average requirement for eight bands of ewes and lambs using the Deschutes range was 0.36 gallon per head per day, and on the Ochoco dry range the average requirement was 0.375 gallon per head per day. For a band of dry sheep watered at the Cabin Lake well the average quantity used daily was 0.26 gallon per head.

With few exceptions one camp tender and water hauler has little difficulty in supplying the daily water needs of two bands of sheep, time being allowed for moving the camp and watering troughs to fresh feed.

This type of water development is an up-to-date version of "the house that Jack built." The extreme fire hazard necessitated the building of roads, roads permit the hauling of water, this makes possible the grazing of sheep, and the consumption of forage by the sheep reduces the fire hazard.

DOUGLAS C. INGRAM,
Associate Range Examiner, Forest Service.

RED-CLOVER Problems The problem of growing red clover
Turn on Production in the United States is essentially a
of Good Domestic Seed problem of seed supply. Not that
it is enough to have good seed. The
soil on which red clover is to be sown must be in good condition, must be adequately supplied with lime, phosphate, and potash, and must be well drained. These requirements are now so well known that no extended exposition is necessary, and they are parts of the whole problem only where they are not all met. Work done by several State agricultural experiment stations has shown that where land is long cultivated the supplies of lime and phosphate tend to become depleted, and red clover is the first crop to feel and to show this deficiency in a lack of vigor and in declining yields.

However, when lime, phosphate, and potash deficiencies, if they exist, have been corrected, there is still no assurance of good stands and good yields unless the right kind of seed is used. Much has been written about the need of pure seed, and properly so; but while this emphasis on mechanical purity and freedom from weed seeds was being made, sight was lost of the fact that not all clover seed was of the same stock, variety, or strain. It has now been learned that the adaptability of a given strain or variety of red clover to the conditions under which it must grow may be very much more important than the mechanical purity of the seed.

The cultivated red clovers have arisen from the wild species which occurs nearly everywhere in Europe and in western Siberia and which is a rather variable plant both as to size and hairiness. In the course of time two groups of varieties have been developed from the wild species, the early double-cut varieties and the late single-cut varieties. Seed of both groups was brought to North America during the seventeenth and eighteenth centuries, and from these early stocks have been

developed our early or medium red clover and our mammoth red clover.

In the course of some 200 or more years of growth under American conditions our red clovers have become adapted to those conditions and have developed into varieties distinct from the European red clover. To-day our red clovers differ from the European varieties in their greater hairiness and in the fact that the hairs stand out at right angles to the stem instead of lying flat against the stem.

Possibilities of Damage

In the United States red clover usually stands for two seasons—the season of seeding and the season of harvesting. During that time the clover plants are subject to certain possibilities of damage, such as



FIGURE 151.—In May, 1928, at Arlington farm, plots seeded to imported European seed, right, had little but weeds. Plots seeded to Ohio seed, left, had a good stand. The stand of all was equally good in June, 1927

severe cold, heaving, diseases, and insect enemies. Any or all of these may reduce or destroy the stand or may injuriously affect the recovery after the first cutting so that there is little second cutting or, in some cases, none at all. When any of these things happen, red clover is a failure or a partial failure, and it has been found that such failures or partial failures are more likely to occur when red-clover seed of a foreign variety is used than when seed of the American variety is used.

It is not possible to say how much red-clover seed is used annually in the United States, but from the figures of home production plus imports and less exports it may be concluded that between 60,000,000 and 70,000,000 pounds of red-clover seed are sown annually in the United States. Of this quantity about 17 per cent is imported seed. The average annual production of red-clover seed for the years 1922 to 1928, both inclusive, was a little more than 53,000,000 pounds, varying from a low figure of 38,000,000 pounds in 1924 to 79,700,000 in 1922.

The average imports have been about 11,000,000 pounds; consequently the average production in the United States would have to be increased by more than 21 per cent if there were to be domestic seed enough to replace the present importations.

The shortage of United States grown seed would not be of so great importance if good crops could be obtained by the use of foreign seed. The yield records of experimental plots where foreign seed from different countries has been tried in comparison with domestic seed show that foreign seed does not generally give as good yields as domestic seed. This is especially true of the seed that has been imported in the largest volume. Until the seed-staining provision of the Federal seed act went into effect, large quantities of red-clover seed were received from Italy, and this seed was found to be especially unsatisfactory. At present the largest volume of red-clover seed coming to the United States is shipped from western Europe, and this, too, has proved inferior to the domestic seed, though sometimes giving fair yields of hay on the first cutting. At Ames, Iowa, in 1926-27, 296 different lots of imported seed were tested, and in every case the yields fell much below the yields from Iowa seed. In 1927-28 tests were made at the Arlington Experiment Farm, Rosslyn, Va., and at North Ridgeville, Ohio. At the Arlington farm the average yield from 50 lots of imported red-clover



FIGURE 152.—Showing poor second growth of European red clover, left; and good growth of American, right

seed was 37 per cent of that from domestic seed, while at North Ridgeville 69 imported lots yielded 72 per cent of the yields from domestic seed. Naturally, among these imported lots some were better than others, a few nearly equaling in yield the average from plots seeded to domestic seed. A very large proportion, however, were near failures.

Increased Domestic Production Necessary

This fact that the great bulk of foreign-grown red-clover seed is unsatisfactory for use in the United States, together with the shortage of domestic seed, makes the matter of increased production of domestic red-clover seed the outstanding problem in a consideration of red clover in the United States. Besides the fact that domestic red-clover seed generally produces plants adapted to conditions in the clover area of the United States, account must be taken of the fact that certain diseases may seriously damage the clover crop. This is especially true of the southern form of anthracnose, and the only remedy for these conditions is the development of resistant strains. Such a resistant strain has been developed in Tennessee, and the use of seed of this strain is to be advised wherever the southern anthracnose disease is

prevalent. The production of more seed is necessary in order that this strain may be more widely used.

While an increase in the production of red-clover seed in the United States is needed for the best interests of agriculture, it must not be forgotten that this increased production should represent the best strains only. At present some sections are producing red-clover seed little more desirable than foreign seed. When increased production is planned, care should be taken to make sure that the seed stock comes from a strain with a good record of production.

In the United States there are two main centers of red-clover seed production, with some areas of minor importance. Most of the red-clover seed in the United States is produced in the North Central States from Ohio to Iowa and the Lake States, but most of the seed produced in these States probably remains at home; that is, it is used



FIGURE 153.—European clovers are often destroyed by anthracnose. Stand in April, 1926, of imported central European seed at right; Virginia seed at left

locally and does not enter into trade in as large a proportion to production as is the case with seed produced in Oregon, Idaho, and Colorado. The combined production of Oregon and Idaho is from 7.5 to 19 per cent of the total production in the United States. There would seem to be no reason why the production of red-clover seed in all the intermountain and North Pacific Coast States should not be increased to a point where the importation of foreign seed becomes unnecessary.

Wherever the production of red-clover seed is attempted, however, care should be taken to begin with good stock. In some parts of the United States foreign clovers do well as hay producers, but when seed is harvested and sold in the eastern consuming section the result is the same as when foreign-grown red-clover seed is used. The trouble is with the variety. Increased red-clover seed production is essential, but the seed must be of a good stock or the red-clover problem in the United States will not be solved.

A. J. PIETERS,
Senior Agronomist, Bureau of Plant Industry.

REFRIGERATOR Economy Is Not Increased by Blanketing the Ice

Sometimes the housewife, desiring to practice economy, wraps the ice in her refrigerator with a blanket of paper or other material. Ice companies and refrigerator manufacturers as well as various educational agencies have protested against this practice as harmful and unscientific. It is the melting of ice which absorbs heat within the refrigerator and thus cools its contents. To be sure, anything that hinders heat from entering the refrigerator itself is advantageous—that is why a cabinet should be well insulated—but anything that tends to prevent the heat within the refrigerator from being absorbed by the melting ice must have a harmful effect, as it causes higher temperatures and accelerates bacterial growth. Hence, if the housewife feels that she must do something to keep down ice meltage, she should blanket her whole refrigerator, not the ice.

An important factor in the efficient cooling of the refrigerator is the air circulation within it. For example, in a cabinet of the side-icer type, the air near the melting ice is cooled and so becomes denser. It therefore moves downward into the milk compartment while the air in the large food compartment, which has been warmed by absorbing the heat leaking in through the walls, moves upward and returns to the ice chamber to be cooled again. Thus anything that blocks the air circulation is likely to prove harmful, and wrapping the ice may easily have just this effect.

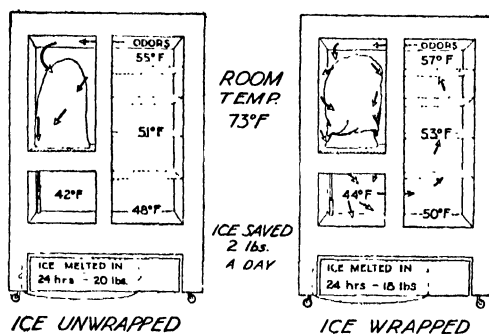


FIGURE 154.—Effect of blanketing ice upon ice meltage and food space temperatures in a household refrigerator

At the Bureau of Home Economics, as part of a study in household refrigeration, two stock refrigerators of the same lot were placed near each other in the same room and were treated as nearly alike as possible, except that in the first cabinet the ice was blanketed carefully each morning by being wrapped in six thicknesses of newspaper while in the second cabinet the ice was not wrapped. These refrigerators were of the side-icer type, having 100 pounds ice capacity, and about 6 cubic feet of food-storage space. Room temperature, refrigerator temperatures at four places, and ice meltage were determined. In icing and re-icing the boxes, the cakes of ice were made as nearly alike as possible. The food space was empty except for the instruments necessary for measuring temperatures. In order to eliminate the effect of any possible difference in the two boxes, conditions were reversed after a suitable length of time, that is, the ice in the second cabinet was wrapped and that in the first was not wrapped.

Saving in Ice Negligible

The diagrams in Figure 154 show the average results of this experiment. The saving in ice was about 2 pounds a day, which would cost about 1 cent. This slight saving hardly compensates for the labor

involved in wrapping the ice, and, if newspapers are used, for the annoyance of removing soggy bits of paper, which of course must not be allowed to clog the drainpipe. As to the temperatures, wrapping the ice in this manner caused an average rise of about 2° F. in each case. This at first sight may not appear so very large, but even 2° may make an appreciable difference in the length of time that food remains wholesome, and often may easily make the difference between food that is fit for human consumption and food that must be thrown away.

Other methods of wrapping may produce slightly different results. For instance in a preliminary trial a "paper blanket" designed for this purpose and offered for sale in stores was used. This had surprisingly little effect either on the ice-melting rate or on the temperatures. E. H. Parfitt, at Purdue University, has described somewhat similar work. He used three thicknesses of newspaper and observed slightly smaller effects than those described here as produced by six such thicknesses. He also observed that butter absorbed less flavor from fish placed in the same refrigerator when the ice was not covered than when it was covered. Some volatile odors are absorbed by the film of water on the surface of the ice cake and are carried down the drainpipe, but wrapping the ice interferes with this process.

Considering the smallness of any possible financial gain from wrapping ice in a refrigerator and the various ways in which harm may be done by this practice, it appears that the housewife should find other means of saving money. The purchase of a well insulated refrigerator is true economy in the long run, but if the household budget does not permit such an expenditure at present, it is better to wrap the entire refrigerator, not the ice.

MILDRED B. PORTER,
Associate Physicist, Bureau of Home Economics.

RESearch Increasingly Necessary as Means of Continued Progress Fundamental research is the attempt to get at the inner secrets or true explanations of "things" or "phenomena," as the scientist usually calls them. The outward expressions of things are the first to attract attention. We see a tree. Then we begin to observe its size and manner of branching; then we study the arrangement of buds and leaves and flowers; then the general structure of these various parts. This leads on to the more minute structure as revealed under the higher powers of the microscope, magnifying from 1,000 to 10,000 times the actual size. What the eye could not see the microscope reveals. The various tissues are resolved into cells; each cell again has its peculiar structure—cell wall, protoplasm, nucleus. These again are found to have complex structure until we come down to molecules and atoms and chemical reactions more intricate than anything we know of in our laboratories.

In this progress toward the ultimate we soon pass beyond what we can see with the highest power of the microscope, and we must then depend on chemical, physical, and biological reactions. How does the green leaf cell make sugar and starch from the carbonic acid gas of the air and the energy of sunlight? What part of the sunlight is used, and under what conditions does the synthesis take place? We know

much about this, but only the more easily observed phenomena. It still remains to interpret these processes in the light of physics and chemistry and our new knowledge of the electric constitution of the atom. "Reactions" take place in the plant cell that scientists have not yet been able to bring about, outside of the cell, in laboratories.

When we have all the facts and processes by which the plant cell makes starch and sugar, proteins and fats, enzymes and vitamins, we may be able to utilize this knowledge to very great advantage. Certain bacteria, for example, are able under certain conditions to fix atmospheric nitrogen. The immense stores of nitrogen in the air are not available to us except through the action of certain bacteria or by expensive chemical processes; yet our lives depend on having a proper supply of available fixed nitrogen. The bacterial cell does the job much more efficiently than we can do it in our laboratories. But how? That is the question, the answer to which may mean very much to the future of the human race.

We are familiar with the fact that many diseases of plants and animals are due to disturbances produced by the attack of other plants or animals, bacteria, protozoa, insects. Some of these disease-producing agencies are so small that they can not be seen under the microscope, and like atoms they must be studied from their reactions.

Mosaic-Disease Problem Still Unsolved

The so-called mosaic diseases, attacking many of our most important crops—corn, clover, vegetables of many kinds, wheat, fruit, etc.—cause millions of dollars loss annually. The infective material appears to be carried from plant to plant by certain species of insects, plant lice, and leaf hoppers.

Just what is this infective material? Is it a living substance or is it intermediate between living and ordinary chemical substance, like some of the enzymes, or a peculiar form of semiliving matter like "bacteriophage," which means little except that it refers to a substance of simpler structure without the power of reproduction of the ordinary type, but which under certain stimuli develops in plant and animal cells and has the power to produce certain disease lesions. When we solve this question we will have the key to some of the most obscure biological and pathological questions. This new knowledge may be of immense practical value, and on the other hand it may have no immediate practical application. At any rate it will be progress in the right direction.

We find that "fertile soil" is more than a mixture of certain physical and chemical substances. It is a living complex of inorganic and organic things, chemical, plant and animal, all having important relations to the formation of what we call soil, and to the changes it undergoes when we cultivate it. What are these relations, biological, chemical, and physical, and how may we control them to our advantage?

Here lie some of the most important questions involved in the problem of feeding the human race when the pressure for food becomes much greater than it now is. That time is not far distant. We are using up the great natural resources of fertility. How may they be most economically replaced for the use of our children throughout ages to come? We must find the key that will unlock the immense stores of atomic energy in the materials we call rocks, minerals, and

soils, and the gases of the air, and reorganize them into forms available for our use. This is what plants have been doing through aeons of time. Great progress in this direction has been made in the last half century. We are on the right track, but we must speed up if we are to have the knowledge we need in time to get it into use before the hard times come.

Applied Science Gets Credit Due Pure Research

Although it is generally recognized that fundamental or pure research is the root out of which applied research grows and that it is absolutely essential to the growth of applied research, yet pure research has little standing with those who raise and dispense taxes. It is not generally recognized as one of the things to be provided for as a public necessity. The reason for this is to be found in the attitude of investigators themselves in not making it clear to the public in general just how the great triumphs of applied research were made possible. We are inclined to give the credit to the one who gives us the finished product rather than to the ones who made the product possible.

Should we leave fundamental research to the universities and privately endowed agencies? It is true that these agencies in the past have been the principal source of fundamental concepts. If their work is properly financed they will continue to be productive. They must in any case train the men who are to carry on research in the future, and this can be done only where fundamental research is in progress.

An effort is now being made through the National Academy of Science and the National Research Council to provide funds through endowment for the promotion of fundamental research in educational institutions. The great privately endowed foundations have done and are doing much in the same direction, as well as in the development of special institutions like the Rockefeller Institute for Medical Research, the Carnegie Institute, the Boyce Thompson Institute, the Smithsonian Institution, etc.

In the field of applied research the great Government laboratories of the Department of Agriculture, Geological Survey, Coast and Geodetic Survey, the Bureau of Standards, and the State experiment stations are outstanding in importance and accomplishment. The time is at hand, however, when progress demands more attention to fundamental research by these great Federal and State agencies.

Industry has recognized this and is itself financing such work in addition to its applied research. A matter, however, of such great importance to the welfare of humanity should not be left to private initiative but should, in part at least, be undertaken by government. This is especially true in regard to food supply and in regard to the health of man and his domesticated animals and plants, that is those activities that deal with man's necessities as distinguished from business.

Research can not be turned out like macaroni or newspaper copy or threshing machines. It is a search for the unknown. The trail is frequently winding and difficult to follow and easily lost. Patience and persistence are necessary to success. Knowledge of what is already known and ability to reason soundly and do constructive thinking are essential in such work.

The life of the world in the final analysis absolutely depends upon the chlorophyll-bearing plant cell, which is able to utilize the energy

of light for the manufacture of starch, sugar, protein, which all living organisms, plant and animal, must have for food.

Agriculture has its real basis in the cultivation of these plants. Every means of protecting and improving them and increasing their efficiency as manufacturers of food and fiber is of immense importance to agriculture and therefore to mankind as a whole.

Agriculture's Debt to Science

Agriculture has advanced exactly in proportion to the expanding of man's knowledge in these respects. A safe and plentiful food supply is the foundation of peace and prosperity and the object of the research functions of the Federal Department of Agriculture and the State experiment stations. Great advances have been possible along the line of reducing the various aspects of agriculture to a more scientific basis, especially through the utilization of the sciences of botany, zoology, chemistry, and physics. This has given us a better understanding of plant and animal nutrition, growth, and reproduction improvement of plants and animals through selection and hybridization, securing varieties resistant to disease and to other limiting factors, or otherwise better adapted to our needs. This alone has more than doubled our potential food supply and is our main hope for the future when world populations have greatly increased, and we are not worried about temporary surpluses. The worry then will be "Are we going to have enough?"

To be certain that our children have enough so that they shall not be harassed by fear of famine or undernutrition, we must lay the foundations now. It is possible that if we can unravel the chemistry and physics and biology of the activity of the plant and animal cell we may be able to better aid their activity or perhaps duplicate it by direct chemical means. This will never be accomplished, however, except by the most searching pure science research.

Studies of this kind have already yielded important results. The effect of sunlight or equivalent radiant energy in the ultra-violet part of the spectrum on the production and functioning of so-called vitamins is opening up a new world in health and nutrition.

The discovery of the control of growth function through length of light exposure opens up a new field of control which has already been put to practical use. Gardeners and plant breeders can bring plants into flower and fruit at will by proper exposure to light and darkness.

The thing most needed now is a public understanding and support of this type of research in universities and in State and Government laboratories.

A. F. WOODS,
Director of Scientific Work.

RICE-GRADING Service Available in South and in California Federal-State grading service for rough rice, brown rice, and milled rice is now available in the South and in California. Grades have been used for several years by several of the rice-marketing agencies in these regions, but not till the 1928-29 season has the grading been federally supervised.

The respective State departments of agriculture that perform commercial rice grading employ graders to do the grading work, but these graders are licensed by the United States Department of Agriculture, and their work is supervised by the Federal department.

Not all the grading agencies that have adopted the Federal standards are now in formal cooperation with the United States Department of Agriculture. Hence, if a buyer or a seller of rice wishes to obtain a Federal-State certificate, he must apply to a grading agency that is under the supervision of the Federal department.

The Federal-State rice-grading service in California in the last year has been used by a growers' association in ascertaining the true quality of the rough rice sold through this association; and also by dealers and millers in the marketing of rough rice, brown rice, and milled rice in distant domestic markets and in foreign countries.

During the 1928-29 season a Federal-State rice-grading service was available in the South for rough rice only. It was used by a large growers' association which is a rough-rice-selling organization. Rough rice valued at more than \$4,000,000 was graded for this association. The grade certificates were used extensively for advising members of the association as to the true quality of their product, for the guidance of the sales managers in selling rough rice, and in connection with some sales of rough rice which were made to foreign countries.

Service Extended in September, 1929

On September 1, 1929, the Federal-State grading service in the South was extended to include brown rice and milled rice. The Texas Department of Agriculture adopted the official United States grades for milled rice and brown rice, and the grader was licensed by the United States Department of Agriculture to grade milled rice and brown rice.

The Federal-State rice-grading services in California and in the South are not compulsory, but may be used by all who wish to have rice graded by a grader who is working under the direct supervision of the United States Department of Agriculture and who must grade strictly in accordance with the official Federal standards.

Federal-State grade certificates for rough rice are of value to growers and growers' associations because they indicate clearly the quality of each lot and because they show not only the premium qualities but also the defects in each lot. Thus the grower learns in what way he should attempt to improve future crops. The grade certificates constitute definite records of the quality of rice available for sale by an association and the quantity of each grade on hand. The certificates for rough rice especially facilitate trading between the association sales managers and the buyers of rough rice. The Federal-State grade certificates for brown and milled rice are of especial value in connection with sales of these rices made to domestic and foreign buyers when the sales are made by grade and the contracts call for grade certificates.

W. D. SMITH,
*Senior Marketing Specialist,
Bureau of Agricultural Economics.*

RODENT Control Aided by Mixing Bait at Cooperative Stations

When it is considered that injurious rodents are responsible for a loss of more than 25 per cent of farm crops and range forage in many localities and an average loss exceeding 10 per cent of the crops and forage over large areas, the importance of undertaking measures for their control in a business-like manner is evident to all concerned. It is essential to efficient control that a supply of poison baits, properly prepared, be available at opportune times in labeled containers, and at reasonable prices. Part of this need may be met through the individual efforts of farmers, orchardists, and ranchers. Such efforts, however, are time consuming, even though the individuals are in position to prepare baits that are really effective, and, compared with quantity production on a cooperative basis, the cost is always high.

Extensive experimental work conducted by the Bureau of Biological Survey has developed the fact that the most effective bait for poisoning ground squirrels, prairie dogs, field mice, and certain other rodents is made from good, clean, specially steam-rolled oats. To prepare the bait properly requires knowledge, training, and mechanical equipment, and to have the bait available at the opportune time requires storage facilities and efficient distribution. For the sake of safety, poison baits must be kept in strong containers with warning labels attached. This requires the requisitioning of special bags or other containers that can be had at a reasonable price only by quantity buying. To produce poison baits in large quantities and at low cost, therefore, cooperative action becomes necessary. Under the guidance of the Biological Survey cooperative bait-mixing stations have been established in several districts of the West where the control of injurious rodents is of great economic importance. Some idea of the work of these stations may be gathered from an account of the operation and accomplishments of the station established in Idaho. This station is the best equipped of the number, and its operations have been conducted on a larger scale than the others.



FIGURE 155.—Poison-bait mixing station operated by the Bureau of Biological Survey for rodent-control campaigns in Idaho; exterior view, with station truck loaded with bait ready for distribution to cooperators

Equipment of Station

The station in Idaho was established in 1927 at McCammon, a central point for distribution of bait, with good railroad facilities and highways. Suitable buildings were leased and machinery and equipment bought in a cooperative undertaking between the Bureau of Biological Survey and the University of Idaho. The plant is equipped with an electric motor and motor-driven roller, especially designed steam cylinder, recleaner, drying fan, and elevators, and with a bag-

ger, a steam boiler, a steam cooker, and other necessary facilities. With these it is possible to steam-roll, reclean mix, dry, and sack about 20,000 pounds of poison bait a day, and approximately 200,000 pounds of oats or mixed bait can be stored at the plant.

Materials used in preparing the bait for cooperators are bought in large quantities by means of a cooperative revolving fund. Oats are purchased in carload lots, strychnine in quantities of 2,000 to 10,000 ounces, and other materials also at wholesale rates, thus making it possible to profit by the lowest possible prices obtainable. The actual cost of preparing the poison baits is prorated on the pound basis, and the bait is sold to cooperating farmers, orchardists, and ranchers at that price. The proceeds from sales are deposited in the cooperative revolving fund, which in this way is continuously replenished, permitting new purchases and sales.

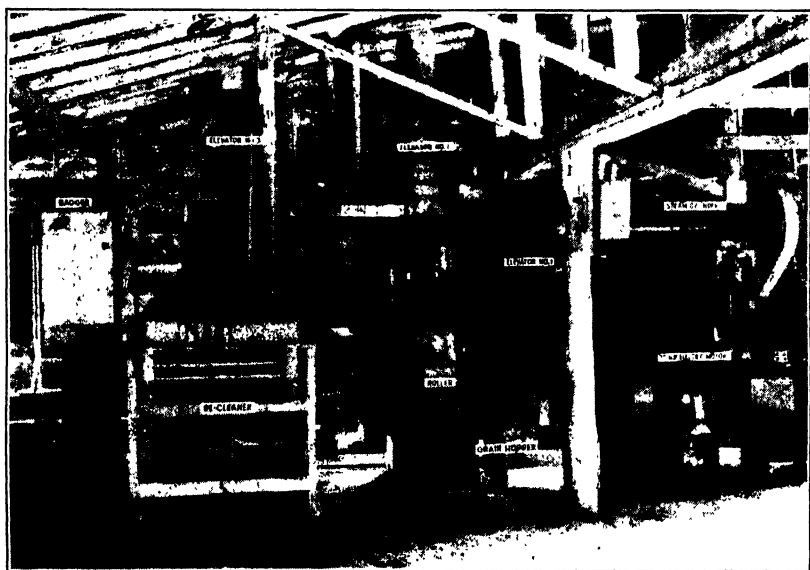


FIGURE 156.—Interior view of poison-bait mixing station, showing hopper, steam cylinder, roller, recleaner, and bagger, from each of which the grain is passed to the next through elevators and chutes, before treatment with poison.

The station is operated by the Bureau of Biological Survey, and this fact insures that the bait shall be prepared by trained men in accordance with the best methods evolved through research. The mechanical operation of the plant is briefly described as follows: The whole oats, dumped into a hopper, are elevated to a steam cylinder, wormed through this cylinder, which is filled with "dry" steam at 80 pounds pressure, and fed into the roller; from the base of the roller the steamed, rolled oats are elevated into the recleaner, and from the recleaner they are elevated into the bagger. All these operations are by machinery and in the order stated, before the grain is mixed with poison.

The whole oats are passed through the steam cylinder before rolling so that in the rolling process the hulls may be slightly opened, permitting the poison to penetrate to the kernel. Experiments with groats and hull-less oats have been carried on to learn whether by their use it would be possible to do away with the steam-rolling process. It

was found, however, that these are by no means so acceptable to the rodents as are oats with hulls, for the tests indicated that the rodents prefer to hull the oats to get at the kernels. Whole oats, therefore, are used, with the hull slightly opened to admit the poison into the kernel.

After the steam-rolling process the oats are recleaned to discharge loose hulls, dirt, chaff, or other materials not acceptable to rodents, so that these may not absorb and waste the poison.

Mixing and Distributing the Bait

The next step is mixing the bait and the poison, which usually is a starch-paste mixture, containing gloss starch, strychnine, saccharin, and sirup, with a small quantity of water, the proportion of each depending upon the rodent against which operations are directed. The starch paste is quickly made in the steam cooker. The poison mixture is then poured over the steam-rolled oats and mixed either by machine or by hand. Then liquid paraffin is added in order to make the bait durable and render it to a certain extent rain-proof when exposed to the weather. The poison bait is dried to the right degree by means of an electric fan, so that it will not mold or heat when sacked. It is then put into strong, properly labeled bags of various sizes and is ready for distribution where needed in rodent-control operations.

The distribution of sacked baits in Idaho is usually made from the plant by rail shipment or by means of a motor truck, which is part of the equipment of the station. In many instances the bait is delivered from the plant directly to the user; but it usually is trucked to convenient points in the counties or communities, from which it can be distributed to farmers through the offices of the county extension agents. Ready-prepared material of uniform quality thus reaches the user, at a price averaging about 20 per cent lower than if he prepared it himself and in a condition far more acceptable to the rodents than would be the home-prepared product.

Accomplishments of Mixing Plant

The station in Idaho during the fiscal year 1929 steam-rolled 436,350 pounds of oats, of which 194,145 pounds were shipped to other mixing stations and 242,205 pounds were made into poison bait---170,055 pounds for use in Idaho and 72,150 pounds for other States.

The saving to the Biological Survey and its cooperators during the year in the cost of poisons and other materials through quantity buying and operation of the station amounted to \$23,560. Most of this saving accrued to the cooperators, as they use the larger proportion of the poison baits. In addition, however, there was an aggregate saving of more than six months' time of county agents in Idaho, by reason of their not having to mix the baits in their respective counties, as was necessary before the station was established; and also an aggregate saving of about six months' time of field representatives of the bureau for the same reason.

The most important accomplishment, however, was the increased efficiency of the poison bait supplied by the plant as compared with bait that could be prepared by individuals working alone or collectively without the station equipment. With the bait furnished by the station it required about 25 per cent less material to do the same amount

of poisoning than with bait formerly used, which was not uniform and not always effective. This is clearly a case of greater efficiency in rodent control through cooperative action and capable management.

W. E. CROUCH,
Senior Biologist, Bureau of Biological Survey.

ROSES of Everblooming Habit Available for Most Requirements

Everblooming roses are available for most of the purposes for which roses are grown. Often special care is required to obtain the desired result, especially in those regions subject to conditions unfavorable to their growth. In very cold places or where strong drying winds prevail they must have special winter protection. In very dry places they must be supplied with an abundance of moisture, and they should always be



FIGURE 157. A double white Rugosa rose

protected from strong winds. Roses are natives of temperate climates, so normally their growth is checked for a period each winter. Under cultivation they thrive only with an annual checking of growth. Winter usually provides for this except in the southern parts of California and Florida. In California this result may be obtained by withholding water for six weeks or two months in summer, but

in southern Florida only a few varieties that are especially adaptable to that climate can be grown.

Although roses are called everblooming, they usually give one large crop of flowers followed by a series of lesser crops that often become somewhat overlapping. The better varieties usually have some flowers at almost any time during the latter part of the season, but there is seldom a crop that is equal to the first flush of bloom.

Everblooming roses are in demand both for garden decoration and for cutting. A few of the cut-flower varieties may be used for garden decoration, but as a rule those not adapted to cutting are the most satisfactory. Among the latter the Rugosa rose (*Rosa rugosa*) and its hybrids are probably the best. In addition to being faithful bloomers, this species and the white and double forms (fig. 157) that pass as unnamed varieties of this species bear large scarlet hips that are showy most of the winter. The foliage is rough, healthy, and attractive. There are several hybrids, as follows: Agnes Emily Carman, double, brilliant red; Amélie Gravereaux, double, carmine purple; Blanc Double de Coubert, semidouble, white, fragrant; Hansen, double, reddish violet; Mme. Georges Bruant, loose, double, white; Magnifica, double, red; New Century, double, pink; Nova Zembla, double, pink with

white tints; *Rose à Parfum de l'Hay*, double, deep red, unusually fragrant; *Ruskin*, double, very deep red; *Sarah Van Fleet*, pink, vigorous; *Sir Thomas Lipton*, double, white, very vigorous; and *Souv. de Pierre Leperdrieux*, dull red.

Baby Ramblers Are Free Blooming

The Baby Ramblers bloom more freely than the Rugosas. Most of them are more dwarf in habit, and the foliage is more subject to black spot and mildew, requiring frequent spraying to keep the foliage in good condition. On the other hand, they are capable of making a wonderful mass display. Some of the varieties are *Aennchen Müller*, medium size, pink; *Baby Dorothy*, pink; *Baby Elegance* (fig. 158)

small, single, pink; *Baby Rambler* (more properly *Mme. Norbert Levavasseur*); *Baby Tausendschön* (more properly *Echo*); *Bordure*, a yellowish red; *Clotilde Pfitzer*, white; *Clotilde Soupert*, ivory white with pink toward center, especially hardy; *Echo*, large, double, pink; *Ellen Poulsen*, double, pink; *Erna Teschendorff*, red, the foliage inclined to mildew; *George Elger*, copper, opening to lemon; *Gruss an Aachen*, very large, flesh white; *Jessie*, red; *Katharina Zeimet*, small, very double white, very free blooming; *La Marne*, an improved *Baby*



FIGURE 158.—*Baby Elegance*, a baby Rambler rose

Tausendschön; *Leonie Lamesch*, coppery red; *Mme. F. Favre*, single, red with white eye; *Mme. Jules Gouchault*, a bright rose color; *Mme. Norbert Levavasseur*, hardy, dwarf, vigorous, scarlet, the first of the baby ramblers; *Mlle. Cécile Brunner*, salmon fading to white, exquisite buds; *Marie Pavic*, light pink, one of the oldest and best; *Meadow Sweet*, semidouble, pink, sweet scented; *Mrs. W. H. Cutbush*, double, pink; *Mignonnette*, pink fading to white; *Orleans*, scarlet with white center, even better than *Baby Rambler*; *Pâquerette*, small, double, white; *Pink Soupert*, pink, foliage inclined to mildew; *Rödhätte*, semidouble, red, fragrant; *Schneekopf*, moderately double, white; *Tip-Top*, white, yellow, and pink; large and beautiful, but a weak grower; *Triomphe Orleanais*, probably the best of the red varieties; and *Yvonne Rabier*, greenish white, opening to sulphur.

China, Bengal, and Bourbon Roses

A group that more nearly approaches the cut-flower roses in appearance and gives sufficient bloom to be satisfactory for bedding includes some of the China, Bengal, and Bourbon roses and those of similar habits. Some of these are Archiduc Charles, deep carmine; Beauty of Rosemawr, carmine, beautiful form, the best bedding rose; Champion of the World, rosy pink; Gruss an Aachen, a baby Rambler with characters much like these; Hermosa, lilac rose, excellent; Mme. Eugene Marlitt, large, carmine; Lucullus, deep purple-red; Pink Daily, pink, excellent, next in value to Beauty of Rosemawr; and Red Macrophylla, small, double, red, low growing.

Of those classed as cut-flower roses the following tea and hybrid teas can be classed as reasonably everblooming. Those marked with an asterisk (*) also make fairly good bedding roses. Col. R. S. Williamson, pink; Dorothy Page Roberts, pink; Florence Haswell Veitch, red;



FIGURE 159.—Mme. Caroline Testout, a hybrid tea rose

Frances Willard, white; Grace Molyneux, lemon; *Gruss an Teplitz, red; Gustav Grünerwald, pink; *Isabella Sprunt, light yellow; Kaiserin Auguste Viktoria, white; *Killarney, single pink; *Killarney Queen, pink; Königin Carola, pink; La Tosca, pink; Lady Ursula, pink; Laurent Carle, red; Mme. Abel Chatenay, pink; Mme. Butterfly, white, yellow, and pink; Mme. Camille, pink; *Mme. Caroline Testout (fig. 159), pink; Mme. Francisca Krueger, bronze; Mme. Jules Grolez, pink; Mme. Lambard, pink; Mme. Léon Pain, pink; Mme. Paul Euler, red; *Maman Cochet, pink; Marie Lambert, white; Marquise de Querhoënt, copper; Mary Countess of Ilchester, red; Miss Cynthia Forde, pink; Mrs. Aaron Ward, copper; Mrs. Arthur Robert Waddell, copper; Mrs. Herbert Stevens, white; *Mrs. Wakefield Christie-Miller, pink; Ophelia, white, yellow, and pink; Papa Gontier, red, almost single; *Radiance, pink; Red-Letter Day, red, single; *Red Radiance, red; W. E. Lippiatt, red; Wellesley, pink; *White Cochet, white; and *White Killarney, white, almost single.

Climbing Roses That Flower All Summer

There are some climbing roses that flower more or less all summer. These are chiefly climbing hybrid teas. They are relatively tender so that many of them may not be hardy north of Philadelphia, Pa., and Columbus, Ohio. Those in the following list are hybrid teas unless otherwise noted: Aglaia, also called Yellow Rambler, a vigorous multiflora with small double, tea-perfumed flowers, canary yellow as they open but becoming white (well-established plants bloom freely throughout the season); Alister Stella Gray, also called Golden

Rambler, a Noisette with small, pale-yellow flowers, deeper in the center, borne in fragrant clusters throughout the season; Climbing Belle Siebrecht, pink; Climbing Gruss an Teplitz, red; Climbing Hermosa, Noisette, large pink flowers, similar to the bush variety; climbing Kaiserin Auguste Viktoria, white; Climbing Lady Ash-ton, pink; Climbing La France, pink; Climbing



FIGURE 160.—The Macartney rose

ing Mme. Caroline Testout, pink; Gainsborough, white; Macartney (*Rosa bracteata*, fig. 160) often miscalled Cherokee rose, is a beautiful single white with small, dark, glossy leaves (though often trained as a climbing rose, it is usually grown as a bush); Mrs. Robert Peary, white; Reine Marie Henriette, red; and Striped Reine Marie Henriette, pink and red.

FURMAN LLOYD MULFORD,
Associate Horticulturist, Bureau of Plant Industry.

ROSES for Trellises and Arbors Are a Result of Hybridizing

the climbing habit, he will discover one American species, *Rosa setigera* and two oriental species, *R. wichuraiana* and *multiflora*, as the chief progenitors, with some hybrids from the oriental *R. bracteata*, *laevigata*, *odorata gigantea*, and *banksiae*.

Many years ago the hybrids from *R. setigera*, known as Baltimore Belle, Seven Sisters, and Prairie Queen, were fairly common, but today American Pillar is the only *setigera* hybrid in common use, and in it the inheritance from *R. wichuraiana* obscures most of the *setigera* characteristics save the flower pattern and the tendency to late blooming.

From the Japanese *R. multiflora*, introduced into cultivation about 1822, have been secured many hybrids, but its climbing hybrids have

The climbing roses of to-day are the results of many years of hybridizing. If one hunts through the pedigrees to discover the ancestors responsible for

proved less desirable than those obtained from *R. wichuraiana*, also introduced from Japan about 1891, with the result that the former has been used in breeding chiefly with *R. chinensis* to produce the race of dwarf-everblooming roses known horticulturally as *R. polyantha*. One still finds such varieties as Crimson Rambler, Aglaia, Mrs. F. W. Flight, and Trier among the older climbing sorts and notes with interest the newer hybrids obtained by Peter Lambert by crossing and recrossing, probably with the variety Trier as a seed parent, a race in which many of the *multiflora* characteristics are still prominent. *R. wichuraiana*, because of its admirable foliage, has been more valued by hybridists and has produced a great variety of seedlings.



FIGURE 161.—A typical form of climbing *Rosa wichuraiana* hybrid

now established in many parts of our South, has been little used, but has in the modern variety Mermaid, with its magnificent foliage and huge pale-yellow single flowers, a worthy representative.

R. laevigata, the Cherokee rose, naturalized here in the South, but, like the last, native in the Orient, is said to figure in the pedigree of Silver Moon and is represented by a pink form, Anemone, and a red form, Ramona.

Another interesting race has been evolved from the European *R. moschata* in which there are two diverging lines of hybrids, one with large flowers as in the variety Pax, and the other with corymbs of smaller flowers as in Clytemnestra, Danæe, or Moonlight.

For the warmest parts of the country, *R. banksiae* from China, in both single and double forms and in white and in yellow, is useful

be exemplified by such old sorts as Dorothy Perkins and Jersey Beauty in which the more or less trailing habit and the small flowered and late-flowering characters of the seed parent are preserved. In other cases, such as the old Gardenia, the large-flowered characteristics of the hybrid tea parent are uppermost, and from this fact breeders have endeavored to obtain from *R. wichuraiana* a modern race of large-flowered climbing roses. These we have to-day in such plants as Breeze Hill, Mary Wallace, Emily Gray, Dr. Huey, Christine Wright, Jacotte, Dr. W. Van Fleet, and Paul's Scarlet Climber.

Rosa bracteata, the Macartney rose, originally from China but

where a tall climber is needed, and the hybrids of *R. odorata gigantea*, of which Belle Portugaise is best known, furnish strong-growing climbers which may take the place of the old Noisette race, once widely grown and still beloved in such varieties as Maréchal Neil and Rêve d'Or.

For the small gardener, choice among these races should be limited to plants that are not too rampant in growth. Most of the multifloras can be dropped as inferior in quality and the choices restricted somewhat arbitrarily to the hybrids of *R. wichuraiana*, some of which almost approach climbing hybrid teas in general style and habit. Such a list might include Breeze Hill, flesh colored; Mary Wallace, rose pink; Paul's Scarlet Climber, scarlet; Dr. Huey, maroon red; Glenn



FIGURE 162.—*Rosa multiflora*, one parent of many climbing roses

Dale, lemon white; and Emily Gray, lemon yellow. To these might be added Pax, a large white musk hybrid; Climbing Lady Ashtown, a fine rose-colored climbing hybrid tea; and Zephirine Drouhin, an intense pink climbing hybrid Bengal.

B. Y. MORRISON,
Senior Horticulturist, Bureau of Plant Industry.

RURAL Community Often Too Small to Support Adequate Institutions

Not many hundreds of years ago, few farmers in certain countries had farms in compact pieces of land. The farms consisted of parcels of land scattered about. It was long before each farm was consolidated into a single parcel. In Europe there are farms not yet consolidated.

This is just about the situation in the United States to-day in regard to the community in which the farmer and his family live. Theoretically, the farmer resides, for local taxation purposes, in a single compact municipality. But actually the American farmer's municipality is divided into scattered community parcels, so that, instead of being located in a single municipal area, he is a part of from three to a dozen little tax-gathering and institution-supporting communities.

The average farm family lives in a school community of not more than 100 to 200 persons. It is likely to be in a highway community not bounded by exactly the same lines as is its school community. If it is in a high-school community is that not slightly different in boundaries from the other two communities? Is not the local police and court community still different? Is there a hospital community? Does it coincide with any of the others? Is there any fire-protection community? Any library community? Any electric light and power community?

The fact is that, except in a few States, any single farm is likely to lie in several different, rather small communities and that no two such communities contain the same farms and the same group of people, and that each of these communities is too small to provide the needful community facilities for each family. There is not enough property in each to support the institution; there are not enough persons to provide an effective group, socially or economically.

-The County-Seat Town

By way of contrast look at the county-seat town or the small city. Here is an incorporated community containing a population which varies, but which frequently consists of between 3,000 and 5,000 persons. This town is a single compact area established by law for community-taxing purposes. All the taxable property is taxed for the tax-supported institutions. The town as a whole constitutes a road district; the whole town is a school district, a fire district, a high-school district, a police district, a library district, a hospital district. All these districts coincide; the community possesses property enough to support the various community institutions and facilities, and people enough to use them effectively and economically. If the town were divided into 15 or 20 school districts, 10 road districts, several library districts, a few hospital districts, it is plain that the institutions would be inadequately supported, for it takes about 3,000 or 5,000 people and their taxable property to support such institutions.

Studies of the Department of Agriculture have uncovered the source of weakness in the farmer's fundamental civic organization—the make-shift character of the farmer's many small local taxing areas. The towns and cities are strong socially and economically because they have a consolidated taxing community, whereas the farmer's position is feeble because his farm is included in many inadequate taxing areas.

Studies show that the trend of organization among farmers is in one of two directions: (1) A new small community or taxing area is created to take care of a new modern institution (a drainage district, a consolidated-school district, a community-house district), or (2) the powers and duties of counties are stretched to include new community institutions for the farmers of the county—such as a county hospital, a county library, a county high school. In either case, the farmer is confronted with a confusion of weak citizenship relations, whereas the town possesses unity and strength.

Difficulty Is Remediable

That farmers have inadequate institutions (or none) for health, education, fire protection, is no longer a matter of necessity. It is a matter of outgrown and neglected civic organization of land and families.

Constant violation of the principle of volume of business in the organization of the farmer's local civic life inflicts a serious social penalty upon him and his children.

Many farmers apparently take their small, inadequate communities as an unchanging decree. But every farmer knows that a farm can be too small to operate as a modern business. Wise farmers set about getting a large enough farm. They know they must have enough horses, machinery, and stock to run the farm. Why do they accept a municipality of many scattered too-small communities?

The science of human groupings for growing needs demands a legalized change from the too-small to the large-enough community. The question is, How make the change? The time may come when the discussion in farming circles of whether "our community" is large enough to carry modern institutions will be as common as the discussion of the price of wheat.

The logic of this whole confused, inadequate-community situation drives one to look for such a reorganization of the farmer's civic community relationships as shall give him a single consolidated taxing community area large enough to support all the modern institutions and facilities he requires. The farmer needs a new rural municipality which in its civic power is on a parity with that of town or small city.

C. J. GALPIN,
*Principal Agricultural Economist,
Bureau of Agricultural Economics.*

SCREW-WORM Losses to Livestock Industry Can Be Reduced

Losses from the screw worm have been estimated at from \$4,000,000 to \$10,000,000 annually. These losses are confined largely to the great livestock-producing areas of the Southwest. Some of them occur in Louisiana and Arkansas on the east and as far as Kansas on the north, but Texas, New Mexico, Arizona, and California suffer most.

While farmers and dairymen may be troubled by the screw worm, the close attention which they are able to give to their livestock largely prevents severe cases and death loss. It is on the range, where the animals can not be so closely watched, that the losses are severe. In the southwestern part of this region, especially where the brush is dense, the losses among calves have been so heavy as to cause cattlemen to discontinue the keeping of breeding animals, and to stock their ranges with steers. As a result of certain changes in ranch practice, however, many ranchmen have more recently returned to the breeding business.

The screw worm attacks all kinds of livestock and even man. Its ravages are probably most severe among sheep and goats, but it is a very serious pest of cattle, horses, and hogs. The losses caused by the insect are brought about in several ways. The death loss is often considerable, especially in sheep and calves. The former show a marked tendency, when infested, to hide in dense thickets, in which they are often eaten alive by the worms. It is now generally recognized by stockmen that many of the sheep and goats which disappear (their loss frequently being charged to theft or escape as their carcasses are not found at the time) are really killed by screw worms. All heavily infested animals show marked reduction in condition, which requires weeks to overcome after the wounds have healed. The wool

and mohair clip is reduced, in some cases the coat being so badly shed as to make shearing not worth while. A number of additional men are required to check up on the stock and round up and treat the screw-worm cases. The number varies according to the severity of the outbreak and often amounts to a 50 per cent increase in the number required to handle the stock in the absence of this pest.

Expense Not Small for Screw-Worm Medicine

The item of screw-worm "medicine" is by no means small. It often runs into hundreds of dollars on a large ranch, and the total for the country probably exceeds \$1,000,000 annually. There are a number of indirect effects in addition, such as limitations on the season of breeding, which may result in some cases in less favorable marketing or increased cost of handling; loss from frequent agitation of herds and flocks; early spring or late fall shearing, which adds to weather hazards and at times brings about heavy loss, especially among goats; and avoidance of branding during periods of screw-worm abundance, which may result in the loss of animals through straying or theft.

There is much variation in the damage produced by screw worms from year to year and in different localities. Warm, showery weather is favorable to screw-worm attack, and when such weather prevails for some time an outbreak is almost certain to occur. This condition is brought about by a greater longevity of the flies, by an apparently increased attractiveness of wounds on account of their moist condition and odor, and especially by more favorable breeding conditions for the screw worms in carcasses, which promptly give rise to hordes of flies intent on laying their eggs in any attractive place available. The facts that the screw-worm flies will breed in any dead animal available and that they are strong fliers preclude the possibility of eradication, but emphasize the importance of community action and of improving range sanitation.

Indirect Benefit From Tick Eradication

The eradication of the cattle tick from a large part of Texas has had a distinct effect in reducing losses from screw worms. The more extensive use of good fences facilitates the handling of cattle and gives an opportunity to find screw-worm cases more promptly. Limiting the breeding season, and consequently controlling the time of birth of young, is a very essential step in cutting losses from this pest. This practice is tied up closely with the production of supplemental feeds on ranches or the feeding of cottonseed cake. Both of these practices have been found advantageous in keeping breeding animals strong and producing better calves, aside from their bearing on the screw-worm problem. The timing of castrating, marking, branding, and shearing to avoid the periods when flies are abundant has also been shown to lessen greatly the trouble from screw worms. Recently, attention has been attracted to the use of a pincer type of emasculator which avoids all bleeding in castration, and thus eliminates this avenue of screw-worm infestation. A study of the factors favoring screw-worm attack indicates that boils, especially in goats, induce a large percentage of the screw-worm infestations in the summer. It has also been noted that boils appear most frequently in animals of low vitality and that screw-worm cases are much more difficult to heal promptly in such animals. This emphasizes the need

of breeding from vigorous stock and eliminating unthrifty animals. The presence of horns, especially among cattle, results in many wounds and consequent screw-worm infestations, and this indicates the advantage to be gained in screw-worm control from systematic dehorning of calves or the breeding of mulley strains.

Burning of Carcasses Reduces Losses

Carcass disposal, preferably by burning, although an indirect method of meeting the screw-worm situation, is probably the most important single step in this direction. (Fig. 163.) Community or even state-wide effort toward

prompt and complete carcass destruction would, it is believed, materially reduce screw-worm losses. The type of pastures where the sick



FIGURE 163.—Carcass ready for burning. A small trench has been filled with wood, and the carcass turned over onto the wood

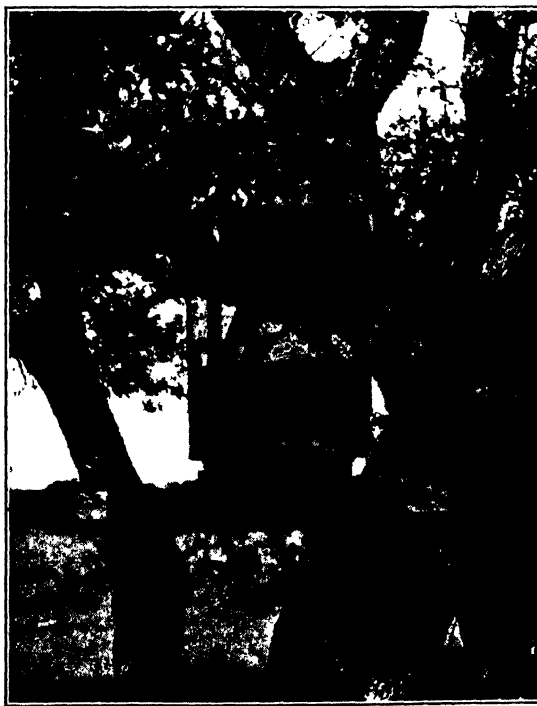


FIGURE 164.—Fly trap, with 10 days' catch of screw-worm flies

When screw-worm infested animals are placed in such houses after the worms are killed their wounds have been found to heal very promptly.

Fly-trapping is considered by many progressive ranchmen as a necessary routine ranch practice. (Fig. 164.) The use of fly traps in

and worm-infested animals are kept while under treatment has been found to have an important bearing on the rapidity with which wounds are healed. Such pastures should be located on high ground free from underbrush, shade being provided by a few large trees, thus eliminating the conditions most favorable for the flies and reducing the likelihood of reinfestation of wounds.

The construction of fly-proof houses for wounded animals is steadily gaining in favor. These screen structures enable the ranchmen to protect their more valuable animals against infestations following operations or accidents.

hospital pastures has been shown to lessen materially the number of treatments required to heal the wounds of screw-worm infested animals. The operation of traps throughout considerable districts in the range country is also thought by many to have distinct merit, but a thorough investigation of the many factors involved is necessary,



FIGURE 165.—Five hundred and seven gallons of screw-worm flies trapped in six weeks in one locality

both to make the trapping most effective and to determine the true value of this plan. In several districts fly trapping is proceeding on an organized basis through the cooperation of a number of ranch owners. (Fig. 165.) In one county in Texas approximately 2,500 traps are in operation. The quantity of screw-worm flies caught per trap during a season averages about 3 gallons, or approximately 100,000 flies. Since each female may lay 1,200 eggs, the destruction of so many flies would certainly indicate that some good is accomplished by trapping.

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Principal Entomologist, Bureau of Entomology.

SEED Testing to Show Value for Planting Is Increasingly Necessary

The testing of seeds intended for planting was started in Europe about 75 years ago and in the United States a few years later. In its early stages, seed testing mainly served the farmer directly with information about the presence of weed seeds and the power of the seeds to develop into plants. The resulting increase of knowledge about seeds led to a definite demand for better and cleaner seeds and for control of the labeling of seeds sold to farmers for planting. To meet this new condition, seed analysts tended to develop seed testing in a manner that gave more attention to relative values for trading purposes than to actual planting values. With the demand for clean seeds, trade competition overstressed high purity value, making elaborate purity tests necessary for seed-control work. The difficulties encountered in testing some seeds for germination have challenged seed analysts to obtain highest possible germination values in an attempt to show their ability to make the seeds grow. This series of developments in seed testing gradually led to arbitrary laboratory methods that did not necessarily serve the original purpose of telling the farmer the value of his seed for planting.

Under present agricultural conditions, accurate knowledge of seeds to be planted is even more necessary than ever before, and seed testing

is attempting to meet the need by getting back to a germination test that will show the possible value of the seed for planting. This is not so simple as it may seem at first. When a sample of seed, especially one of questionable value, is germinated under artificial conditions in the laboratory, there will be found a series of seedlings of decreasing vigor and some seeds that have not germinated.

Soil Testing Distinguishes Good from Bad Seed

For a practical report, the analyst must divide the seeds into two classes, good and bad; but there is no definite natural division in a lot of seedlings produced under artificial conditions. It is evident that many seedlings have only enough energy to break their seed coats, while others, because of injury in harvesting, are not complete seedlings; yet it is difficult to know where to draw the line between useful

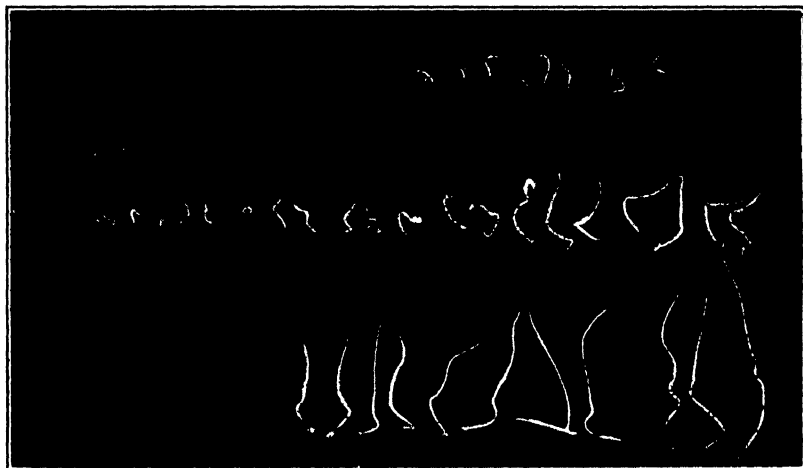


FIGURE 106.—Fifty seeds of a sample of poor quality red-clover seed were germinated between blotting paper. After six days the seedlings were arranged roughly in the order of their value. This series shows the difficulty of determining by such a test alone which seedlings are of possible value

and useless seedlings. Moreover, growing seeds between blotters or other artificial materials does not furnish natural conditions for the seedlings to become established. Why not, then, make use of natural conditions and put the seeds in soil and let the seeds themselves show whether they can develop into plants? With the present demands on seed-testing laboratories, it is not possible to go back to making all germination tests in soil, but it is possible to become familiar with the behavior of seeds planted in the soil, and in this way be able to make a laboratory test that will correspond to one made in soil and give as nearly as can be done the value of the seed for planting. The seed laboratory of the Bureau of Plant Industry is now making germination tests on this basis so that the results will be of as much value as possible to the farmer.

It is now realized that the actual germination of a sample of seed may not be of much value if the sample carries infection of some plant disease. American seed laboratories are beginning to cooperate with

plant-disease experts to give information about the presence of disease where this is possible.

The Federal and State seed laboratories are anxious to be of service to agriculture. The farmer should learn what type of seed will fit his conditions, and then the seed-testing laboratory can help him find the seed he needs.

E. H. TOOLE,

Associate Physiologist, Bureau of Plant Industry.

SHEETS Wear Chiefly at Shoulder Height, Durability Tests Show Until more is known about the relative value of fabrics made from different kinds and qualities of fiber, it will be impossible to direct American-grown textiles into the most useful and profitable types of materials.

Such information is also necessary if the consumer is to be assisted in making wise selections from the fabrics on the retail counter. The great variety of materials now available makes it almost impossible for the average purchaser to judge even very obvious values accurately. In an effort to improve the situation, many women are asking that fabrics be labeled with some kind of specifications, either in regard to their construction or the performance which may be expected from them. Already a few technical groups have met to discuss the possibility of doing this and have tried to determine the kinds of quality specifications that would be most useful to home makers. In all of these, the quality of the fibers which compose the yarns in the materials must be taken into consideration, but just how much and in what ways this affects the usefulness of the finished fabric for some particular purpose is not completely known and has increased the complexity of the problem.

Sheeting is a good example of a fabric of simple construction in which the quality of the cotton fiber should be a very important matter, and yet practically nothing is known of the relation of the length, strength, and similar properties of the fiber to the durability of the finished sheet. If these facts were available it would be possible to have the sheets labeled with information of this kind and thus give the consumer a way of deciding which particular sheet would best serve her purpose.

Hotel's Discarded Sheets Examined

A study of just these points has been undertaken by the Bureau of Home Economics in cooperation with the Bureau of Agricultural Economics. Sheets are being woven from different kinds of cotton selected and graded by specialists in this work. When these are ready, actual wearing as well as laboratory tests will be made on them. As a preliminary step in the study, the Bureau of Home Economics recently examined the wear shown by 400 sheets discarded by one of the Washington hotels. These were all of one brand and were purchased in October, 1921. Since the hotel maintains a fairly uniform laundering procedure it was possible to obtain at least an approximate picture of the reaction of this one type of sheet to institutional service.

The bureau was particularly interested in the kinds of wear shown by these sheets. However, another question had been raised in connection with sheeting durability which seemed to need study. Recently there has been some demand among institutional buyers for sheets with equal hems top and bottom. The argument usually advanced is that bedding wears out where the feet rub and equal hems would decrease the possibility of this friction always coming on the same portion of the sheet. With this contention in mind, the areas of maximum wear on the hotel sheets were also noted.

These were determined by placing a sheet on one of the beds on which it was used and estimating the position of a person lying upon it. A diagram was then made on which the folds of the sheet and the areas occupied by various parts of the body were indicated. (Fig. 167.) As all the sheets and beds were the same size, the areas of wear could be judged by referring to this diagram. Such a chart was made for each sheet, and by the use of a system of abbreviations, the condition of each was recorded.

The types of wear were classified as holes (chiefly of the "pepper pot" type), splits, triangular tears, and threadbare places in which either the warp or the filling yarns had given away. Some sel-

vages were worn as well as the edges of the turned hems and the line upon which they were stitched.

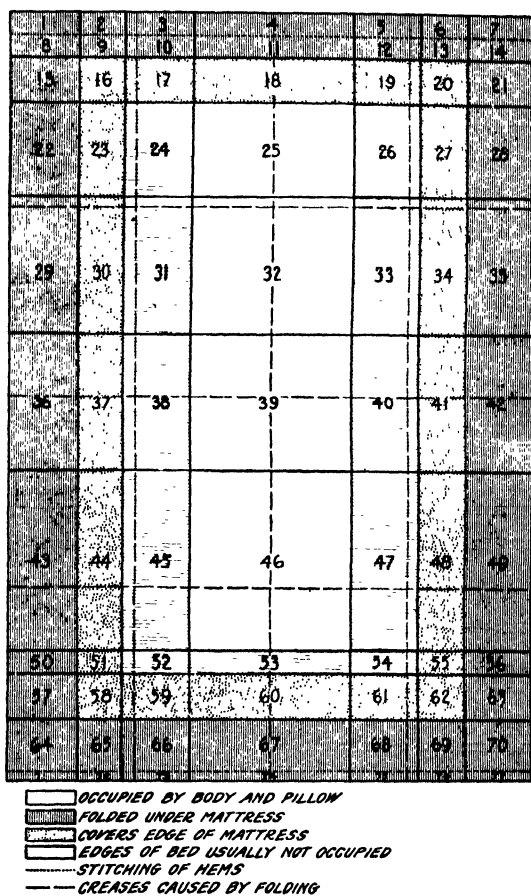


FIGURE 167.—Chart used for recording data from each bed sheet. Area 25 is ordinarily occupied by the pillow, area 32 by the shoulders and back, area 39 by the hips, and area 46 by the feet and legs

Maximum Wear at Shoulder Height

From the records obtained, it was very evident that the area of maximum wear on these sheets was in the majority of cases at the shoulder height. (Fig. 168.) Some showed two different places of greatest wear, but even when these were included, there were 304

instances of maximum wear at the shoulder height and only 17 of greatest wear in the area which the feet and legs occupy. In fact the latter figure was the smallest obtained. In 59 cases, the center of the sheet showed the greatest wear.

One reason advanced for these results was that the guests at the hotel at which these sheets were used are chiefly women. It might be that the low-necked night clothing commonly worn permitted the body perspiration to reach that part of the sheet and cause more rapid deterioration. In order to check this point, worn sheets were obtained from the Washington branch of the Young Men's Christian Association and examined in the same way. In these, the types and areas of wear were the same as those shown by the sheets used in the

hotel for women. However, since only 60 of these were available, the results may not be representative.

Most of the wear on the hotel sheets was due apparently to weak filling yarns. Breakage of these was responsible for 385 of the threadbare places, while breakage of the warp was noted in only 117 such instances. This weakness of filling yarns also became apparent in the record of breaks on the folds. The vertical folds showed 26, 208, and 28 breaks on the left, center, and right folds, respectively, while the upper, center, and lower horizontal folds were broken in 8, 13, and 6 instances, respectively.

The large number of breaks on the center lengthwise fold was inter-

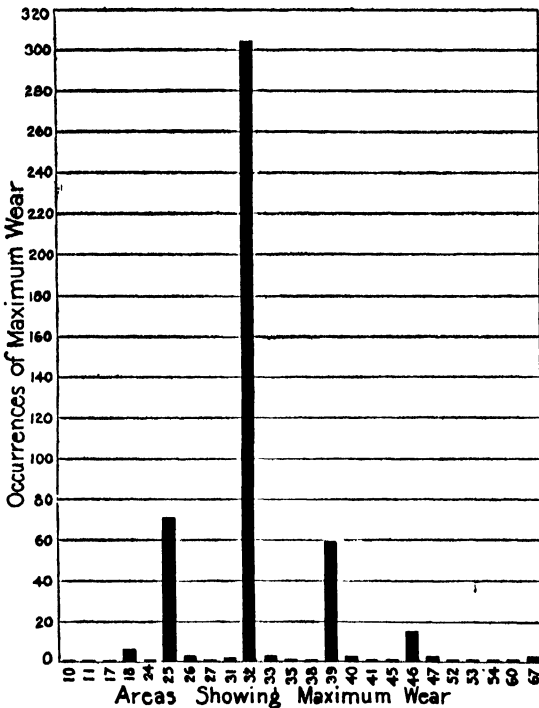


FIGURE 168.—Diagram showing number of times maximum wear of 400 bed sheets occurred in areas designated in Figure 167

esting. This weakness in sheets has been noticed by many observers and has usually been attributed to the fact that the sheets are often folded there before being run through the ironer. However, these sheets had always been ironed without being folded. The folding was done by hand afterwards. This raises the question as to whether the line through the center is injured in the manufacturing process or is subjected to excessive wear while the sheets are stored.

Torn Selvages Numerous

The large number of torn selvages clearly pointed to the need for greater attention on the part of home makers and institutional man-

agers to the condition of the springs and bedding against which sheets rub. Among the 400 sheets, there were 689 cases of worn selvages.

However, the most startling figure obtained related to the types of wear. There were 5,232 splits reported, most of which were warp-wise. That is, it was the filling yarns that had given way. Small holes, also, were numerous, but there were only 120 cases where the holes were caused by yarn knots (usually considered an important matter in fabric durability).

These results have been brought to the attention of sheeting manufacturers, and it is hoped that some firm will strengthen those parts of the sheet that first show wear. It is certainly possible to construct a sheet with stronger selvages and reinforcements at those places which receive the maximum amount of wear.

RUTH O'BRIEN,

Senior Textile Chemist, Bureau of Home Economics.

S NAG Felling by Dynamite Cheaper Than by Sawing

Standing dead trees, or snags, are a constant source of concern to any agency operating in the Douglas fir region of Oregon and Washington, which is the area west of the Cascade Range. Snags are present in virgin timber stands, on cut-over lands, and particularly in old burned-over areas. In the burned-over areas as many as 30 per acre can be found. Getting rid of them involves an expenditure from which there is no return in merchantable material. They must be felled, however, not only on construction work, but for protection purposes. Quick control of a forest fire often depends upon rapidity in snag felling.

The usual way to fell snags has been by sawing them off, but the

cost in this region for a snag with an average diameter of 35 inches is \$1.17. This high cost is a time or labor charge, and any method to be appreciably cheaper must be faster.

Since no merchantable material is involved in snag felling, the problem becomes one of demolition, and this suggests the use of explosives. Tests on the Columbia National Forest made it apparent that the most effective use of explosives is in holes bored into the snags. Hand boring, however, is even more expensive than sawing; hence the development of power-boring machines.

The first machine used was a semiportable electric-light plant which drove an electric drill carrying a 1½-inch ship auger of sufficient



FIGURE 169.—Boring snags with the electric drill

length to reach the center of any of the snags to be removed. This assembly, although satisfactory from an operation standpoint, was too heavy for pack-horse transportation; so a light 2-cycle, air-cooled, gasoline motor was adopted for driving an auger through the medium of a flexible shaft and a gear-reduction head. This assembly may be dismantled into three units, each of which can be easily carried by one man.

Technic of the Operation

The technic of the operation is to drill 1½-inch holes from two sides of the snag on an angle as nearly 45° as possible. For example, the holes on the south should slope upwards and those on the north downward. All holes are detonated at the same time, and the snag is thrown to the north. The action of the explosive is to kick the butt outwards, using the stump as fulcrum. The direction of throw is not absolute although in experiments on 60 snags, 43 per cent fell within

50° of the aim. Increasing the amount of explosive increases the control of direction.

Experimentation showed 40 per cent dynamite to be the best explosive, safety in handling, cutting action, and the fact that less difficulty was experienced with "powder sickness" being taken into consideration.

The amount of powder to use for a snag of given diameter was determined through trial and error and the following formula evolved.

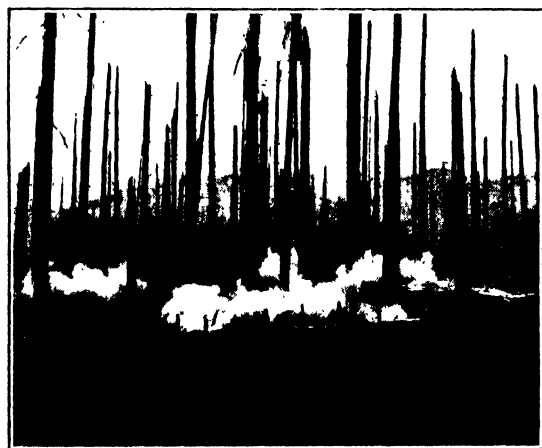


FIGURE 170.—Blasting down snags in bunches

Take the area of the cross section of the snag at breast-height in square inches and divide by 110. The result will be the number of sticks of 40 per cent dynamite required. One hole should be bored for each four sticks to be used. The 40 per cent dynamite makes a horizontal cut of from 12 to 14 inches in width.

* Saving Increases With Size of Snag

The experimental work shows an advantage in cost in favor of boring and blasting as against sawing which increases appreciably with the size of the snag and the amount of pitch encountered. The data obtained under the particular conditions of the experimental work show that the cost per 1,000 snags for sawing is \$1,074.27, while the cost of boring and blasting is \$861.98, a saving of about 20 per cent. These figures are, of course, averages and may not be applicable to specific areas where there is a wide difference in the distribution and size of the snags. Where there is a large number of small-diameter snags the costs would probably be more nearly the same for both



FIGURE 171.—Where the experiments in boring and blasting snags were conducted

methods; yet if there is a preponderance of large-diameter or pitchy snags, the balance would be considerably in favor of the boring and blasting method.

F. V. HORTON,
Supervisor, Columbia National Forest, Forest Service.

SOIL Activities Affected in Complex Manner by Plowing in Green Manure

The problem of increasing or even maintaining the nitrogen content of the soil is increasingly important as our soil nitrogen becomes

more and more depleted. It is generally conceded that, as a result of our extensive system of farming, the nitrogen content of most of the arable soils is lower than formerly. If profitable crops are to be grown, nitrogen must be supplied to them as economically as possible. Owing to the motorization of transportation, it is no longer possible to purchase quantities of animal manures from city stables. Farmers, therefore, must turn to other sources of nitrogen.

Commercial forms of nitrogen, on account of their easy application and quick action, are being used, but for many purposes are still too expensive. Green manuring, that is, the plowing under of an immature crop grown expressly for this purpose, has been practiced since ancient times. If the crop grown is a legume or a mixture containing a legume, the nitrogen of the soil is increased. Bacteria in the nodules occurring on the roots of legumes are able to supply the plant with nitrogen by using the free nitrogen from the air, thereby not only saving the nitrogen already in the soil for the next crop, but adding

more to it when the green manure is plowed under. This method of soil enrichment has appealed to many farmers and during the last decade has been used to an ever-increasing extent.

This great increase in the use of green manures has stimulated much experimental work upon the green-manure crops best suited to particular soils and climates. Obviously it is important to obtain a good growth of the green-manuring crop; poor crops have little value when plowed under.

Factors Are Numerous and Complex

The effect of green manuring upon the quantity and quality of the succeeding crops is usually the farmer's measure of the efficiency of the practice. But a failure to produce an increase in crop yield should not be attributed to the green manure as such. Many factors are involved in the decomposition of a heavy application of green material. Some are well known, others obscure. Research work on the effects of green manuring upon the biological processes taking place in the soil has been stimulated in proportion as green manuring has been practiced. For the past two years studies along this line have been carried on in the division of soil microbiology. Special attention has been paid to the effect upon the soil microflora, the accumulation of nitrates, the evolution of carbon dioxide, and changes in soil acidity.

The decomposition of green manure is greatly influenced by the temperature and moisture of the soil. Most soil bacteria require a temperature of 65° to 70° F., or often higher, for rapid activity. Temperatures below this, such as occur in the early spring, retard their growth. Lack of proper moisture has the same effect. The rate of decomposition is therefore dependent on both of these conditions. Experiments have shown that under the best conditions succulent green manure was nearly all decomposed in 7 days. But at lower temperatures the rate was slower, and more than 14 days were required. If tests are made under variable field conditions, the physical factors affecting the decomposition must be carefully noted. The experiments should be carried on under a wide range of temperature and moisture conditions and conclusions based on those conditions alone. Much of the former work on the changes occurring in the soil after green manuring has been based upon experiments carried out in laboratory flasks with handfuls of soil. Some investigators have used jars in greenhouses for holding the soil. An elaboration of the latter method is the use of greenhouse benches of sufficient area and depth to approximate field conditions. The advantage of working in the greenhouse is that moisture and temperature, which are uncontrollable in the field, can be kept at the optimum.

Effects of Plowing-In Green Material

Plowing under a large amount of green material has a profound effect upon the microscopic life in the soil. The number of bacteria close to and in the material increases enormously. Under favorable conditions the numbers may increase ten times within two days; in four days there may be fifteen to twenty-five times the original number. This increase has been found to take place in the decomposing material and adjacent soil. No increase took place one-half inch away from the decomposing material. After seven days there is a decrease in the number of bac-

teria which is as rapid as was the increase. This means the end of the easily decomposable material. The numbers, however, often remain higher than in the untreated soils. This may be due in part to the slow decomposition of the more resistant compounds, such as lignin, in the green manure.

Fungi have often been considered as important agents in this decomposition. Their activity seems to be confined to the surface layer of the soil and to material less succulent than green manure. They and the actinomyces, which are closely related to them, do not seem to be able to compete with bacteria in the decomposition of fresh, green material turned completely under by the plow.

Protozoa and nematodes have been found to increase in the decomposing material. Their numbers always remain low in comparison with the smaller bacteria. But the fact that they increase seems to indicate that they have some function; whether this be to help in the decomposition of the green manure remains to be seen.

Composition of Green Manure

Green manure consists mostly of carbonaceous and nitrogenous material. The decomposition of this gives rise to carbon dioxide and ammonia, respectively. The former escapes from the soil into the air; the latter is absorbed by the soil and, through the action of bacteria, is oxidized to nitrite and then to nitrate. It is obvious that the greater the percentage of nitrogen in the green manure, the more nitrate will be formed from its decomposition. This explains in part why legumes are so beneficial as green manures.

On the other hand, if the nitrogen be low, as in mature rye, it may all be absorbed by the bacteria in the process of decomposition. It will be released slowly when the bacteria die. No benefit, or only a slight benefit, to the succeeding crop might be seen in this case. Harmful effects may even result if the nitrogen is as low as it is in straw. The bacteria and fungi decomposing the straw, in this instance, obtain their nitrogen from the soil and may successfully compete with the crop plants for the available nitrogen. As a result succeeding crops suffer for want of nitrogen.

The rate at which the organic nitrogen in green manure is changed into nitrate depends, first, upon the rapidity with which the material is broken down and ammonia formed. In the early stages of decomposition the ammonia and even the nitrate in the soil is used by the bacteria in their growth. In the case of leguminous green manures which have a high percentage of nitrogen, an excess of ammonia over the needs of the bacteria soon develops. By the time the decomposition is nearly complete and the numbers of bacteria decrease, the largest amount of ammonia is found. The process of nitrification being fairly slow, no great increase in nitrate may be found until two or three weeks after the treatment. Under conditions of lower temperature, the process of decomposition is slowed down, with the result that nitrates do not accumulate until about the fourth or fifth week. This, of course, will vary greatly under different conditions. However, it is easily seen that this has a practical bearing upon the relationship of the plowing under of the green manure to the seeding of the succeeding crop. Recommendations in this respect should be made only after careful experimentation in the particular locality.

Economic Loss Through Decomposition

As stated above, the carbonaceous material in the green manure is decomposed to carbon dioxide and lost in the atmosphere. This actually represents a great economic loss. It is true that the nitrifying bacteria need carbon dioxide in order to function and that carbon dioxide may render the soil minerals more soluble, but these processes, *working over long periods of time, require only small amounts of carbon dioxide*. Large amounts of carbon dioxide are evolved from the soil during the period of greatest activity of the bacteria. In fact, the curves representing the amounts of carbon dioxide evolved and the numbers of bacteria are remarkably similar. Under these conditions carbon dioxide evolution might be used as a measure of the bacteria activities.

The idea that green manuring produces acidity in the soil appears to be rather widespread. Some investigators have reported that the acidity of the soil was increased, whereas others have reported the opposite. This difference in results is probably due to the varying conditions of the experiments. The ammonia liberated in the decomposition of the leguminous green manure changes the reaction of the mass and of the adhering soil toward the neutral point if the soil is acid and tends to make the soil more alkaline if it is neutral. This local effect of the ammonia perhaps explains how it is possible that nitrification takes place in soils which have been found too acid for the nitrifying bacteria. If all, or most, of the ammonia were quickly changed to nitrate, the condition of that area should be more acid than at the start. This requires a comparatively long time, and other factors may enter to change the final results. However, there is no doubt that the difference of opinion as to the effect on soil acidity is due to the local character of the decomposition and to the fact that the reaction is changed during the process.

Other Effects of Green Manure

The effect of green manure upon the physical character of the soil, the moisture-holding capacity, or the prevention of erosion and the leaching of the soil by the use of winter cover crops are outside the scope of this article. But in passing over this phase of the subject it should not be overlooked that these factors may have an important bearing upon microbiological processes in the soil. The mere growing of legumes has a stimulating effect upon the bacteria of the soil, and succeeding crops may be benefited even though the tops of the legumes are removed.

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SOIL Color Is Clue to Presence or Lack of Desirable Qualities

The color of a soil is, in itself, of minor importance. Black and red soils, and dark soils in general, absorb a greater proportion of heat from the sun's rays than white and light-colored soils. This fact makes the dark soils earlier than the light-colored soils, other things being equal. As an indicator of the composition, however, and general condition of the soil, the color is at once a valuable and distinguishing characteristic.

The different colors in soils are caused by differences in composition, but it is not always the soil that has the greater quantity of the colorful constituent that has the deeper color. It is the form or combinations in which the colored constituents occur that give color to the soil.

A black soil is usually a rich soil and, in general, the darker the soil the more productive it is. Black color in soils is due to organic matter in combination with lime. The actual quantity of organic matter need not be large. Black soils frequently contain less than 2 per cent of organic matter. But if the organic matter is saturated with lime and other bases, it makes a most favorable condition for plant growth.

Organic matter also colors soils brown. Such soils are generally acid, and the organic matter, while it may be abundant, is not saturated with lime. A reddish-brown color ordinarily indicates the presence of organic matter and iron oxide. Examples of such soils are the prized "mahogany lands" of the South.

Red and yellow soils owe their color to the iron oxide they contain in the free state. Experience has shown that the coloring matter is in the clay or finest matter in the soil. This clay is largely made up of silica, alumina, iron oxide, water, and organic matter. The color does not depend primarily upon the total quantity of iron present, as the percentage of this constituent varies little in the clay of surface soils whatever color they may be.

Clay is formed by the weathering of silicate rocks. When first formed, it is colorless, or nearly so, and contains a large proportion of silica, this heritage being a reflection of the composition of the parent rock. After the clay has been formed, weathering processes diminish the silica and increase the alumina and iron oxide.

Compounds in Clay

The compounds present in the clay are fixed by the relative quantities of silica on the one side to alumina and iron on the other. The soil clay appears to be made up of a stable compound of silica, alumina, and water. In this compound there are two or more molecules of silica to one of alumina. Iron can and does replace a part of the aluminum in this compound, and when in such a combination, the iron does not give any red or yellow color to the soil.

When the clay weathers and loses so much silica that there are less than 2 molecules of silica to 1 of alumina and iron, a part of the iron is set free and appears as a reddish yellow, hydrated, ferric oxide. With further weathering the proportion of free ferric oxide is increased and the clay becomes deeper red or reddish brown in color. In the brilliant red and reddish-brown soils of the Southern States the iron is practically all in the form of free ferric oxide. If the proportion of free ferric oxide in the soil is small, the soil is yellow; if it is large the soil is red or even brownish red.

These red or reddish-brown soils are rated high agriculturally. The reason for this is not so much on account of the ferric oxide they contain as because of the soil condition indicated by the presence of the ferric oxide. The red color shows at once that there is an adequate quantity of colloidal matter to supply and conserve plant food and that drainage and other general soil conditions are favorable for plant growth.

White or light-colored soils are in poor repute and justly so, for such color shows a lack of important constituents. Very light-colored soils

are generally sandy and contain neither the clay nor the organic matter necessary to absorb and retain plant food and water. Light-colored spots in colored areas indicate that such soils have been subjected to the slow leaching that takes place in water-logged soil where the organic matter has disappeared, and the lime, phosphoric acid, iron oxide, and manganese have been dissolved away from the surface soil.

Other Colored Constituents

The soil contains other colored constituents in addition to organic matter and iron oxide. Streaks of "black sand," or magnetite, are occasionally seen along roadsides and in gullies. Other colored minerals are sometimes apparent, but these are of very minor importance. In the Southern States there are a few examples of soils of a peculiar chocolate-brown color. These soils are colored reddish brown by iron oxide, primarily, but the peculiar shade seems to be due to an admixture of manganese dioxide.

Thus it is seen that soil color upon which pioneers have based their opinion of the value of the soil, is a distinguishing characteristic of soils. The color not only diagnoses the presence or absence of desirable constituents, but is a clue to the composition and consequently the properties of the clay, the active ingredient of the soil.

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SOIL'S Acidity Can Be Accurately Expressed by the pH Value

The use of the words "sour" to express a condition of acidity, and "sweet" to express the absence of acidity, is quite generally accepted, with regard to soils.

However, if one were to say that a soil had a pH value of 5.0 and another soil had a pH value of 7.4 one would be stating practically the same thing, namely, that the former is sour and the latter is sweet, but using a technical term which is rapidly becoming popularized and is a definite expression of the intensity of acidity. In brief, therefore, the pH value is a number which expresses the intensity of acidity and is capable of being accurately determined. It is well to bear in mind, however, that the pH value is not a measure of the quantity of acid or acid substances present, but indicates the intensity of acidity only. The significance of the pH value may be further simplified by reference to water.

From a chemical point of view water may be considered as yielding to a very small degree two simpler component parts, one part (the hydrogen ion), characteristic of acids, and the other part (the hydroxyl ion), which is characteristic of alkalinity. In pure water the concentrations of these two parts are equal, and the resulting condition is one of neutrality; that is, the water is neither acid nor alkaline. At the neutral point where neither acid nor alkaline properties are exhibited, the pH value is known to be 7.0, and values below 7.0 indicate increasing acidity and values above 7.0 indicate increasing alkalinity. There always exists in any aqueous solution what might be called a condition of balance or equilibrium between the part characteristic of acids and the part associated with alkalinity. That

is, when the concentration of the acid part (hydrogen ion) increases, the alkaline part (hydroxyl ion) decreases and vice versa, but neither part ever becomes zero. Since there are always present in any aqueous solution both the acid and the alkaline parts, one may refer to any aqueous solution, whether acid or alkaline, in terms of the amount, or better, the concentration of the acid part.

The resulting condition or reaction, then, obviously depends entirely upon which part is in excess. When a determination of the acidity is made it is the concentration of the acid part or hydrogen ion which is determined, and this is expressed for convenience in a form called the pH value. In this mathematical change over to the pH value it so happens that low pH values, that is, values below pH 7.0, represent increasing acidity, so that the acidity at a pH value of 4.0 is greater than that at pH 5.0, pH 5.0 is greater than pH 6.0, and at pH 7.0 the neutral point is reached. As the pH value increases above 7.0 the soil or solution becomes more alkaline, that is, the alkalinity at pH 8.0 is greater than at pH 7.0, that at pH 9.0 is greater than at pH 8.0, etc.

Two General Methods Widely Used

For the determination of the pH value two general methods have been widely used, the electrometric, and the colorimetric methods. The electrometric method, as the name implies, employs complicated electrical apparatus, whereas the colorimetric method, the simpler of the two, and sufficiently accurate for many practical purposes, makes use of substances known as indicators, the colors of which vary with the acidity or alkalinity of the substance being tested. Comparison is then made against color standards of known pH values, which have been standardized by the electrometric method. Because of its ease of manipulation, as well as the simple apparatus required, the indicator method, of which there are many adaptations, has found wide application not only in the laboratory but in the field and among florists, nurserymen, etc., or where a laboratory is not available.

The determination of pH values has found extensive application in the industries and in research and particularly in the field of agricultural investigations. To the investigator in almost any field an accurate knowledge of the intensity of acidity alone or linked with other factors is of considerable importance. In those instances where it is necessary to correct soil acidity by the application of lime (increasing the pH), or to increase the acidity by the use of ammonium sulphate or sulphur (decreasing the pH), the effect can be accurately followed by determining the pH value. A knowledge of soil reaction or the pH value has also proved of exceptional value to those sections where potato growers have sustained losses due to scabbing of potatoes. It has been found that an acidity represented by a pH value of about 5.2 will inhibit the potato-scab organism from functioning, and consequently in those sections where scab is present the disease has been controlled by keeping the soil fairly acid, namely, at about pH 5.2. With the legumes a neutral or slightly alkaline reaction has been found desirable, this also being the case for sugar beets. Similar data have been and are being accumulated for a large variety of crops, and while some tolerate a fairly wide range as regards the pH value, others show a more or less definite preference for an acid, neutral, or alkaline soil.

Since in many instances yields as well as quality are definitely associated with the soil reaction it is obvious that an accurate knowledge of the pH value is important.

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SOILS Under Various Conditions Hoard, Bank, or Waste Plant Food Nature hoards some of her assets in an almost miserly manner. Even plant food may be kept in such closed vaults as to be only a long-time investment, bearing a very low rate of interest. Some of the coarser soil mineral grains such as feldspars, micas, and the like may contain large potential supplies of potassium and other fertilizing elements, while the soil containing them may be of low fertility because of their lack of availability. There appears to be little in the way of farm practice which can be done to release these hoarded stores.

A second class or condition of plant food is that which serves as a savings bank, whose deposits are subject to the "draft" of a crop whether for the present or the future. The colloidal material appears to offer such banking facilities to the soil. The colloidal material consists primarily of very fine decomposed rock fragments, together with organic matter. It makes up by far the greater portion of what is frequently known as the clay content of soils. The colloidal material differs from the coarser mineral grains in other ways than in particle size. In addition to having a marked influence on the physical behavior of soil, its ability to serve as a plant-food depository is most marked. The presence of colloidal material in itself does not insure a rich plant food deposit. Its character varies widely, being a resultant of parent-rock material, climate, and vegetation. This colloidal material, although sometimes badly impoverished by nature is, in the main, the soil's most valuable asset. Furthermore, it is the plant-food asset over which the farmer has the greatest control. Little can be done to significantly alter the quantity of colloid in a soil, but much can be done to maintain or improve its quality.

Colloidal Material May Store Plant Food

A bank deposit can not be indefinitely drawn upon without some steps being taken to make deposits to the credit of the account. Colloidal material is the agency through which such credit may be effectively restored to the soil. This is possible because of the great adsorbing or holding power of the soil colloids for mineral constituents. This appears to be characteristic of both the mineral and the organic portion of the colloid. When plant foods are added in the form of fertilizers to a soil of normal colloid content, only a part of the water-soluble material added may be taken up immediately by a growing crop. The rest may be held by the colloids in such a way that the loss in drainage water is but very slight. Thus the crop of a later season may share the benefits, and the balance not used may accrue to the credit of plant food.

Not all plant food of soil colloids is "subject to check" by growing plants; some is "on time deposit," and additional requirements must be met before it is available for use. Organic matter frequently serves

in this capacity. In addition to serving other beneficial purposes, organic matter is a source of readily available plant food. Recent investigations have emphasized the availability of its plant-food constituents and its relatively high capacity for retaining plant food as compared with the mineral portion of the colloids of the less fertile soils. Regardless of the kind of mineral colloid each load of manure added and each crop residue turned under becomes a "credit slip" to the plant-food account.

Some Soils Difficult to Build Up

If a soil has a very low colloid content, as is the case in very sandy soils, banking facilities are not at hand, and valuable plant food may be lost. Even organic matter may be rapidly decomposed and much of its value washed away. Nitrates especially are leached out in the drainage water. Under such conditions plants must be fed in a hand-to-mouth manner without the expectancy of building a bank account for the future. It is extremely difficult under certain conditions to build up the fertility of sandy soils, or even of some soils of finer texture containing certain kinds of colloidal material, beyond the necessities of a single season. Such soils for profitable use require frequent additions of quickly available plant food. Any attempt to treat them as storehouses of plant food as in the case of most medium and heavy soils is apt to mean plant food wasted.

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SOYBEAN Industry Is Rapidly Developing in United States

A manufacturing industry, using soybeans as the raw product, is developing rapidly in the United States. The basis of this industry—the soybean itself—is by no means new. The soybean has been grown in the Orient since ancient times, and its many uses make it the most valuable legume grown in that part of the world.

The soybean was introduced into the United States as early as 1804, but only in the last 10 years have we really begun to appreciate it. Production is now reaching commercial proportions. The crop has many things in its favor. It produces a large yield of beans and an excellent quality of forage. Soybeans are easy to grow and to harvest. The crop is relatively free from insect enemies and plant diseases. Finally, the beans themselves have great possibilities in the production of oil, meal, and human food and industrial products. Soybean production in the United States will continue to increase as we find better methods and machinery for handling the crop and still more uses for the soybean and its products for industrial purposes.

And right here is where the minds of industry are working to give a permanent market for this crop. Most of the soybeans produced in the United States above those required for planting purposes have been crushed for oil and meal for several years. But almost overnight this industry has reached proportions that warrant its support by growers of soybeans and users of soybean products. Soybeans yield,

per ton when crushed, about 250 to 300 pounds of oil, 1,600 to 1,650 pounds of meal, with about 100 to 150 pounds milling loss.

Soybean Oil is Semidrying

Soybean oil is a semidrying oil. At present, about 75 per cent of the soybean oil used in the United States, both domestic and imported, is used by the paint and varnish industry and in the manufacture of linoleum, oilcloth, and artificial leather. Smaller quantities are used in the manufacture of liquid soaps, printer's ink, and other products.

Soybean meal is often referred to as merely a by-product of the manufacture of soybean oil. As a matter of fact, the meal obtained from crushing a ton of soybeans is worth 50 per cent to 60 per cent more than the oil. It is the demand for the meal which seems to hold promise for the future of the soybean-crushing industry. Thousands of tons are now being used in the manufacture of mixed dairy feeds and in poultry mash. Another outlet for the meal is in the manufacture of glue for use in the building-material, furniture, and other industries. So great has the demand for this product become that imports during the year ended June 30, 1929, totaled 76,000 tons. This is more than double the quantity imported during the 12 months ended June 30, 1928.

There is also a potential outlet for the soybean and its products in the preparation of various articles of human food. Several agencies have attempted to commercialize these products with varying degrees of success. Among the products which have been given attention are: Soybean flour (used largely in the feeding of diabetics); breakfast foods; soy sauce; and preparations for infant feeding. As research work in this field progresses the manufacture and use of these and other food products may be expected to increase.

Crushers Need Constant Supply

The farmer's main interest in the soybean industry is a dollars-and-cents proposition. Domestic crushings would have to more than double to offset the quantities of oil and meal now imported and used by various industries. Crushers must have a constant supply of soybeans in order to operate continuously. This in turn enables them to contract their capacity output with manufacturers using soybean products. Several mills in the Middle West contracted with growers for large acreages in advance of the 1929 crop harvest at a guaranteed price. The price is based on United States No. 2 grade soybeans, inspected on delivery by a Federal inspector. This plan was tried out for the first time in 1928 with mutual satisfaction to the contracting parties, and is doing much to stimulate the soybean-growing industry and to promote confidence in the soybean as a cash crop.

Given the support of agriculture, the soybean-crushing industry should develop rapidly, and as it develops the soybean grower will profit.

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SOYBEANS Are Valuable for Silage When Grown With Other Feed Crops A number of promising silage crops, adapted to cane-belt conditions, have been raised and fed to beef cattle in a series of experiments at the Iberia Livestock Experiment Farm near Jeanerette, La. Corn produces a lower tonnage there than in northern latitudes and is often damaged by cane borers. Biloxi soybeans, however, grow luxuriantly, and the plan of ensiling mixtures of this legume and other crops is being studied to determine which combination is the best.

Silage has been made for a series of years, in these experiments, from corn, sorgo (saccharine sorghum), shallu (a nonsaccharine sorghum), Japanese sugarcane, and sugarcane, each ensiled alone and also with approximately one-third, by weight, of Biloxi soybeans. Chemical analyses of samples of the silage of each experiment, made by the Louisiana experiment station, showed that the addition of soybeans increased its crude protein and fat content. These silages were fed to young steers with a concentrate ration made mainly of cottonseed meal and rice by-products.

In four feeding experiments sorgo silage was compared with sorgo and soybean silage. In two of these, sorgo silage produced 5 per cent greater gains and more economical gains than sorgo and soybean silage. However, in the other two experiments the sorgo and soybean silage produced so much more economical and rapid gains than the sorgo silage that as an average for the four experiments about 15 per cent more feed was required and about 15 per cent less gain was made by the sorgo-silage lots than by the lots receiving sorgo and soybean silage.

Corn and Soybean Silage

In the case of seven experiments comparing corn silage with corn and soybean silage, the corn silage made the best showing three years, the corn and soybean silage the best for the next three years, while the other year they were practically the same. The averages for the experiments show that corn and soybean silage produced gains which were equally rapid and as economical as corn alone.

The Biloxi soybean—then without a name—was introduced by the department in 1908, from China. It was placed in the care of the late S. M. Tracy, who had charge of a proving ground for new-plant introductions at Biloxi, Miss. The variety was found to make a very vigorous growth there, and in 1914 Professor Tracy began to distribute it under the name it now bears. It found favor at once because it was very hardy and vigorous in growth. It also proved to be suitable to a wide range of variation of soils and climatic conditions and is especially suited to the Gulf coast region.

The planting of corn and soybeans, in alternate hills, in the same row, at the same time, so that the two crops may be cultivated together, has come to be the most popular method of planting soybeans in the Gulf coast territory. Some county agents in Louisiana estimate that from 90 to 95 per cent of the corn acreage of their counties is thus interplanted with soybeans.

They have found that beans planted in this manner do not materially reduce the yield of corn grain, also that they do reduce the cost of cultivation by shading out grass and weeds during the cultivating season. For silage the combined crop of corn and soybeans gives a

greater tonnage than either crop alone. In 5-foot rows with corn-stalks 18 inches apart, one to two stalks in the hill, and a thick inter-planting of soybeans, one may expect from 5 to 6 tons of corn and nearly as much beans. Late-planted corn makes a larger stalk, causing a larger ratio of corn to beans.

Perplexing Soybean Harvesting Problems

The problem of fully utilizing the crop on the farm has not been solved, though it is hoped that the experiments, here described, will help to reduce much of the present waste. Harvesting the seed in the South comes at a time that interferes with cane and rice harvests, and to some extent with cotton picking. Seed-harvesting machinery for this rank growing bean is inefficient. The middle and late summer period is generally too rainy to permit haymaking on an extensive scale, and silos have not come into general use. A large portion of the crop is, therefore, used only as a soil-enriching crop. Many soils are reaching



FIGURE 172.—Corn and Biloxi soybeans grown in rows 5 feet apart, in Louisiana

the stage where cotton, grown following a crop of soybeans turned under, makes too much growth of stalk and leaves, and farmers are looking for a more profitable way to use that part of the soybean crop which is in excess of their seed and hay requirements. Accordingly, the use of soybeans for silage, in combination with other feed crops, is a promising means of utilization.

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STARCHES from Cannas and Dasheens May Aid the Textile Industry

Dasheens and edible cannas hitherto grown chiefly for use as food are now being studied by the Bureau of Home Economics as a source of starch for the commercial sizing of textiles. In view of the fact that the Hawaii Agricultural Experiment Station in cooperation with the United States Department of Agriculture has done considerable work on the cultivation and development of the edible canna and that the

Bureau of Plant Industry has been interested in extending the use of the dasheen, it has been thought of sufficient importance to make extensive study of the properties of these starches.

The edible canna and dasheen plants grow very readily in tropical and semitropical climates and produce large tuberous rootstocks from which starch can be easily and cheaply extracted. The edible canna in appearance is very similar to the flowering variety of canna often seen in the flower gardens of this country. However, it does not have the same gorgeous blossoms, for this plant seems to give all its strength to the excessive growth of stems and rootstocks. In the process of extracting the starch the rootstocks are washed and grated, the pulp together with large quantities of water is screened to remove fibrous materials, and the starch is allowed to settle out by the sedimentation process or is removed by a centrifuge. After repeated washings in water the starch is dried and is ready for use.

Dasheen Commercially Grown Since 1913

The dasheen is a variety of taro. It has been grown commercially in the Southern States since 1913. The tuberous growth on the dasheen consists of one or more large edible central corms and several edible cormels, which, as analyzed, have a starch content of approximately 26 per cent. Although the size of the starch grain is extremely small and a gummy substance prevents rapid settling of the granules when suspended in water, it has been found in this laboratory that the starch can be extracted easily by grinding the dasheens, kneading the pulp under water, and settling out the starch by means of a centrifuge. After several washings in fresh water and centrifuging, the starch is pure and free from protein and may be dried.

The canna starch used for tests was obtained from the Hawaii Agricultural Experiment Station. It is a lustrous starch and is characterized by its very large granules. When heated with water it forms a viscous paste which has great stiffening power in the sizing of fabrics. This stiffness has been quantitatively measured and found to be greater than that of wheat starch, which has the highest value of the more common textile-sizing starches—wheat, rice, corn, and potato. Because of the high viscosity of the paste the stiffening property may be due entirely to a coating over of the fabric with the paste rather than to a thorough penetration into the fabric. Experiments are now being carried on with a view to correlating stiffness with the penetration of the starch into the fabric.

Dasheen starch when tested for its stiffening power in fabrics was found to have a value almost as great as canna starch. Since swollen starch granules are known to exist in starch pastes, and since the dasheen granule is even smaller than that of rice, it is assumed that there is greater penetration of the dasheen starch into the fabric. If a fabric sized with dasheen starch is ironed it should have a desirable glossy finish.

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Bureau of Home Economics.*

STARCHES Imported for Some Uses, Though U. S. Makes Surplus Cornstarch

Starch is obtained commercially from relatively few plant products, although it occurs in practically all forms of vegetable life. Most of the commercial starches are obtained from corn, potatoes, wheat, rice, cassava or manioc, sago palms, and arrowroot. The greater part of the starch produced and consumed in the United States is cornstarch. Potato starch is the most important starch produced and consumed in Europe, but it is of much less importance in the United States. Its production in the United States is small and is decreasing, whereas the imports of potato starch have already exceeded the domestic production, and are increasing.

The manufacture of wheat starch ceased in the United States during the World War, but it is now being produced by two factories. The importation of both wheat starch and rice starch has been increasing since the war. In 1922, 62,556 pounds of rice starch and 210 pounds of wheat starch were imported; in 1927 the importation of rice starch was 251,038 pounds and of wheat starch 46,076 pounds. Some Florida arrowroot (*Zamia* or wild sago starch) is being produced, but there is no production of true arrowroot, cassava, or sago starches in the United States. These three starches are therefore imported.

Table 18 and Figure 173 give a summary and analysis, as far as is possible with the data available, of the domestic consumption of the starches used in the United States. Because of the absence of detailed data for all the years given in the table, it was not possible to determine the consumption of wheat, rice, and arrowroot starches separately. The figures for cassava starch (tapioca flour) and sago starch (sago flour) include, in addition to the pure starches, cassava and crude sago, respectively, but the importation of these is relatively small as compared with the importation of the pure powdered cassava and sago starches.

TABLE 18.—*Production, consumption, exports, and imports of starch in the United States for stated years*¹

CORNSTARCH

| Calendar year | Domestic production | Total exports ² | Imports for consumption in United States | Domestic consumption | |
|---------------|----------------------------|----------------------------|--|----------------------|----------------------------|
| | | | | Total | Percentage of all starches |
| | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | |
| 1904..... | 311, 140, 814 | 56, 102, 679 | ----- | 255, 038, 135 | 72. 78 |
| 1909..... | ³ 638, 825, 366 | 36, 549, 910 | ----- | 602, 275, 456 | 82. 39 |
| 1914..... | ³ 574, 247, 697 | 62, 023, 600 | ----- | 512, 224, 097 | 78. 21 |
| 1919..... | 727, 962, 234 | 269, 140, 557 | ----- | 458, 821, 677 | 74. 39 |
| 1921..... | 860, 224, 469 | 257, 795, 466 | ----- | 602, 429, 003 | 86. 35 |
| 1923..... | 839, 382, 402 | 204, 235, 141 | 25, 140 | 635, 172, 401 | 82. 72 |
| 1925..... | 854, 125, 467 | 232, 749, 350 | 64 | 621, 376, 181 | 79. 89 |
| 1927..... | 1, 012, 175, 194 | ⁴ 252, 521, 207 | 14, 140 | 759, 668, 127 | 82. 10 |
| Average..... | ----- | ----- | ----- | ----- | 79. 85 |

¹ The data upon which these figures are based were compiled from the following:

Domestic production from Thirteenth and Fourteenth Censuses of the United States; Census of Manufactures of the United States for 1923, 1925, 1927; Tariff Information Survey G-33, 1921.

Imports and exports from Foreign Commerce and Navigation of the United States, Bur. Foreign and Domestic Commerce, Dept. of Commerce.

² Almost entirely cornstarch. Data on cornstarch for table use not available.

³ Includes some starch purchased for reprocessing and mixing.

⁴ Includes corn flour.

TABLE 18.—*Production, consumption, exports, and imports of starch in the United States for stated years*¹—Continued

POTATO STARCH

| Calendar year | Domestic production | Total exports ² | Imports for consumption in United States | Domestic consumption | |
|---------------|---------------------|----------------------------|--|----------------------|----------------------------|
| | | | | Total | Percentage of all starches |
| | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | |
| 1904 | 27,709,400 | | ³ 4,438,038 | 32,147,438 | 9.17 |
| 1909 | 24,873,415 | | ³ 15,418,259 | 40,291,674 | 5.51 |
| 1914 | 23,540,472 | | ³ 13,934,741 | 37,475,213 | 5.72 |
| 1919 | 16,477,186 | | ³ 3,194,595 | 19,671,781 | 3.19 |
| 1921 | 8,924,927 | | 6,100,577 | 15,025,504 | 2.15 |
| 1923 | 4,689,751 | | 11,981,555 | 16,671,316 | 2.17 |
| 1925 | 10,127,556 | | 10,714,747 | 20,842,303 | 2.68 |
| 1927 | 7,078,425 | | 27,272,048 | 34,350,473 | 3.71 |
| Average | | | | | 4.29 |

TAPIOCA, TAPIOCA FLOUR, AND CASSAVA

| | | | | | |
|---------|--|--|-------------------------|-------------------------|-------|
| 1904 | | | ⁴ 36,640,206 | ⁴ 36,640,206 | 10.46 |
| 1909 | | | ⁴ 56,363,629 | ⁴ 56,363,629 | 7.71 |
| 1914 | | | ⁴ 71,304,728 | ⁴ 71,304,728 | 10.89 |
| 1919 | | | 95,652,649 | 95,652,649 | 15.51 |
| 1921 | | | 50,458,450 | 50,458,450 | 7.23 |
| 1923 | | | 93,882,460 | 93,882,460 | 12.23 |
| 1925 | | | 118,411,974 | 118,411,974 | 15.22 |
| 1927 | | | 110,408,412 | 110,408,412 | 11.93 |
| Average | | | | | 11.40 |

SAGO: CRUDE AND SAGO FLOUR

| | | | | | |
|---------|--|--|-------------------------|-------------------------|------|
| 1904 | | | ⁵ 7,845,268 | ⁵ 7,845,268 | 1.67 |
| 1909 | | | ⁵ 16,796,780 | ⁵ 16,796,780 | 2.30 |
| 1914 | | | ⁵ 9,970,717 | ⁵ 9,970,717 | 1.52 |
| 1919 | | | 2,900,936 | 2,900,936 | .47 |
| 1921 | | | 4,150,314 | 4,150,314 | .59 |
| 1923 | | | 7,452,941 | 7,452,941 | .97 |
| 1925 | | | 6,325,300 | 6,325,300 | .81 |
| 1927 | | | 5,864,225 | 5,864,225 | .63 |
| Average | | | | | 1.12 |

ALL OTHER

| | | | | | |
|---------|------------|--|------------------------|------------|------|
| 1904 | 17,845,121 | | ⁶ 2,903,283 | 20,748,404 | 5.92 |
| 1909 | 13,836,866 | | ⁶ 1,484,770 | 15,321,636 | 2.10 |
| 1914 | 22,976,178 | | ⁶ 962,314 | 23,938,492 | 3.06 |
| 1919 | 39,073,667 | | ⁶ 659,765 | 39,733,432 | 6.44 |
| 1921 | 24,905,011 | | ⁶ 694,986 | 25,599,997 | 3.67 |
| 1923 | 14,323,043 | | ⁶ 323,814 | 14,646,857 | 1.91 |
| 1925 | 10,055,271 | | ⁶ 812,014 | 10,868,185 | 1.40 |
| 1927 | 13,311,252 | | ⁶ 1,641,074 | 14,952,326 | 1.62 |
| Average | | | | | 3.34 |

TOTALS

| | | | | | |
|---------|------------------------------|-------------|-------------------------|-------------|----------------------|
| 1904 | ¹⁰ 11 356,695,335 | 56,102,679 | ⁷ 49,826,795 | 350,419,451 | ¹² 50.77 |
| 1909 | ¹⁰ 677,535,647 | 36,549,910 | ⁷ 90,063,438 | 731,049,175 | ¹² 105.92 |
| 1914 | ¹⁰ 620,764,347 | 62,023,600 | ⁷ 96,172,500 | 654,913,247 | ¹² 94.89 |
| 1919 | ¹⁰ 783,513,087 | 269,140,557 | 102,407,945 | 616,780,475 | ¹² 89.36 |
| 1921 | ¹⁰ 894,054,407 | 267,795,466 | 61,404,327 | 697,663,268 | ¹² 101.08 |
| 1923 | ¹⁰ 858,395,196 | 204,235,141 | 113,665,920 | 767,825,975 | ¹² 111.24 |
| 1925 | ¹⁰ 874,308,294 | 232,749,350 | 136,264,999 | 777,823,943 | ¹² 112.69 |
| 1927 | ¹⁰ 1,032,564,871 | 252,521,207 | 145,199,899 | 925,243,563 | ¹² 134.05 |
| Average | | | | 690,214,887 | |

⁴ Includes corn flour.⁵ Fiscal-year figures.⁶ Not specified as including tapioca flour.⁷ Not specified as including sago flour.⁸ Rice starch, wheat starch, and all preparations fit for use as starch not separately provided for.⁹ Wheat starch and starch processed and packed.¹⁰ Includes an indeterminate amount of duplication due to the fact that the starch is made by certain establishments and sold to other establishments in the industry which use it as a material in the manufacture of other products.¹¹ In addition, 1,309,691 pounds of cornstarch were made by establishments engaged primarily in the manufacture of products other than those covered by the industry designated.¹² Per cent of the average total of 690,214,887.

Cornstarch Consumption 80 Per Cent of Total

In the United States the consumption of cornstarch averages, for the years given in Table 18, about 80 per cent of the total starch consumed. Cassava starch (tapioca flour) is next in importance, averaging about 11 per cent, potato starch about 4 per cent, sago starch about 1 per cent, and all other starches, which include rice, wheat, and arrowroot starches, about 3 per cent.

In general, for the period from 1904 to 1927 there have been no radical shifts in the relative consumption of the various commercial starches. The general average trends in each case are summarized as follows (fig. 173): There has been a slight increase in the percentage of cornstarch used in this country. Also, the consumption of cassava starch has increased. On the other hand, there has been a

slight decrease in the percentage of potato starch, of sago, and of other starches consumed in this country.

As regards the total quantity of starch used (Table 18 and fig. 173), there has been a marked increase for the period, with the exception of a drop during the war when the demand for starches for industrial purposes was subordinated to the need of the raw materials for food. During the war period there was a great demand for starch substitutes, but after the close of the war they were not of such importance.

Owing to the fact that each kind of starch has its special properties, one

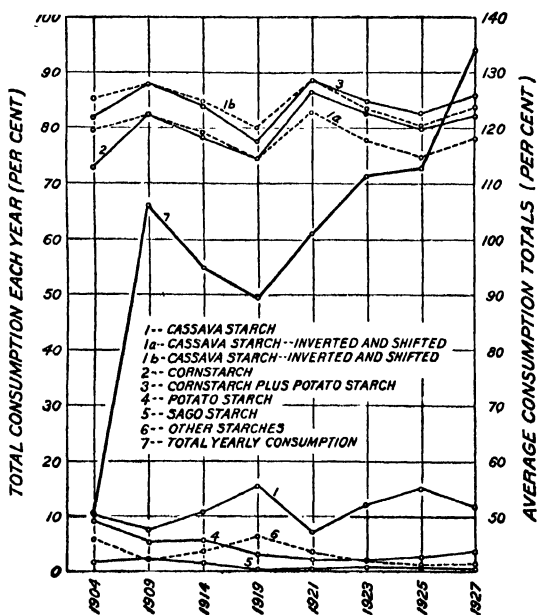


FIGURE 173.—General average trends in the consumption of starches in the United States

kind of starch is used for certain purposes even when there may be lower-priced starches available. It can hardly be expected therefore that any one kind, such for example, as cornstarch, will completely displace all other kinds of starch in this country.

Competing Kinds of Starch

Anyone not acquainted with the differences between the various kinds of starch may find it hard to understand the statistics given in Table 18 or why, with the rapid development of the cornstarch industry in recent years, other kinds of starch should continue to be imported. The production of cornstarch in this country each year since the war has exceeded the total consumption of all starches in the United States. The competition with such a strong, rapidly develop-

ing industry is undoubtedly responsible for the relatively small quantities of potato, wheat, rice, and sago starches consumed in the United States, these being used mainly for purposes that require starches having special properties. On the other hand, tapioca or cassava starch, as will be seen from Table 18 and Figure 173, is more of a competitor of cornstarch for those uses which do not require a starch having special properties. The market price of cassava starch (tapioca flour) is generally very nearly the same as that for cornstarch.

With these facts in mind, it will be of interest to examine the curves in Figure 173. Upon first examination of curve 1 for cassava starch and curve 2 for cornstarch, it will appear that there is an increase in consumption of cornstarch when there is a decrease in consumption of cassava starch, and a decrease in consumption of cornstarch when there is an increase in consumption of cassava starch. Further, the increase of one is about of the same magnitude as the decrease of the other. If curve 1 for cassava starch is inverted and placed near curve 2 for cornstarch, as in curve 1a, the correlation is more easily seen. Further, since potato starch is more of a competitor of cassava starch for use in making certain dextrans, than is cornstarch, a comparison of curve 3 showing the consumption of potato starch and cornstarch with the inverted curve for cassava starch (curve 1b) makes the correlation even closer. The curves would probably be found to approach even more closely if from the figures for the consumption of cornstarch should be deducted the quantity of cornstarch exported in the form of dextrin and modified starch. Since the war the United States has been exporting increasing quantities of dextrin, the dextrin industry in this country having been developed as a result of the war. No figures are given for exports of dextrans before the war. These correlations show, therefore, very decidedly that increased consumption of cassava starch causes a decreased consumption of cornstarch.

Use by Various Industries

Table 19 shows the distribution of the cornstarch used by various industries, expressed in percentage of total production and also percentage of domestic consumption, for the years 1918, 1925, 1926, and 1927. In some cases there has been a definite change in the distribution of the cornstarch for domestic consumption. Its use by bakers, flour mills, and mixers has decreased. The high figure for 1918 is without doubt due to the war emergency need for supplementing wheat flour with other materials for bread and bakers' goods. Owing to national prohibition, there has been a decided drop in the use of starch in the form of refined grits by brewers since 1918. The consumption of cornstarch (not in the form of glucose or sugar made from starch) for the manufacture of confections was low in 1918 because of the war-time restriction of the production of confections. War-time conditions may also explain the change in the use of cornstarch by chemists, color manufacturers, and manufacturers of explosives. There was a distinct increase in the use of cornstarch for manufacture into dextrin, exports of which have increased since the war. There was a small increase in the use of cornstarch for paper, paper box, paste, billboard, and asbestos, but a gradual decrease in the consumption of cornstarch by the laundry trade. The use of cornstarch for

textile purposes has increased decidedly, probably owing to the use of so-called soluble or thin boiling starches.

TABLE 19.—*Relative consumption of cornstarch used by various industries in stated periods*

| Industry | Percentage of total production in— | | | | Percentage of total domestic consumption in— | | | |
|--|------------------------------------|-------------------|---------------------------------|-------------------|--|-------------------|---------------------------------|-------------------|
| | First half of 1918 ¹ | 1925 ² | First half of 1926 ² | 1927 ³ | First half of 1918 ⁴ | 1925 ² | First half of 1926 ⁵ | 1927 ³ |
| Bakers, bakers' supply, flour mills, and mixers | 15.4 | 2.3 | 2.6 | 2.5 | 15.8 | 3.3 | 3.5 | 3.5 |
| Baking-powder manufacturers | 6.2 | 5.3 | 5.6 | 5.2 | 6.4 | 7.5 | 7.5 | 7.2 |
| Brewers (refined grits) | 7.1 | 0.1 | 0.2 | 0.4 | 7.3 | 0.1 | 0.3 | 0.6 |
| Confectioners and confectioners' supply | 2.3 | 4.2 | 4.0 | 3.5 | 2.4 | 5.9 | 5.4 | 4.8 |
| Chemists, color manufacturers, and explosives | 2.5 | 3.0 | 3.1 | 3.2 | 2.6 | 4.2 | 4.2 | 4.4 |
| Dealers and repackers (bulk) | 4.8 | 7.9 | 5.9 | 4.5 | 4.9 | 11.2 | 7.9 | 6.2 |
| Dextrin makers and foundries | 9.5 | 3.4 | 5.1 | 8.5 | 9.9 | 4.8 | 6.8 | 11.7 |
| Paper, paper box, paste, billboard, and asbestos | 3.9 | 6.4 | 6.7 | 7.7 | 4.1 | 9.1 | 9.0 | 10.6 |
| Grocers (packages) | 21.4 | 17.1 | 20.9 | 14.4 | 22.1 | 24.2 | 28.1 | 19.9 |
| Laundry (bulk to laundry trade) | 2.7 | 1.8 | 1.7 | 1.6 | 2.8 | 2.5 | 2.3 | 2.2 |
| Cotton mills and other textiles | 15.8 | 13.4 | 13.8 | 16.1 | 16.3 | 19.0 | 18.5 | 22.2 |
| Miscellaneous | 5.4 | 5.4 | 5.0 | 4.8 | 5.6 | 7.6 | 6.7 | 6.7 |
| Export | 3.1 | 29.4 | 25.5 | 27.5 | | | | |

¹ War service committee on corn products; Prices of Corn and Corn Products, H. F. Bruning, [U. S.] War Indus. Board, Price Bull. 10: 13 (1919); Starch and Related Materials, U. S. Tariff Com., Tariff Inform. Surveys G-33: 10 (1921).

² Starch Production and Trade of Leading Countries, J. A. LeClerc, Com. Rpts. (Dec. 6, 1926), No. 49: 615.

³ Calculated from data in Development of the Corn Starch Industry in the United States, F. T. Pope Com. Rpts. (July 16, 1928), No. 29: 160.

⁴ Calculated from data given in reference under footnote 1.

⁵ Calculated from data given in reference under footnote 2.

In recent years these thin boiling starches have been used in increasing quantities. They are of great value in many industries, especially in sizing and stiffening cotton goods. They have reached the same commercial importance as dextrins. This is especially the case with cornstarch. Modifying cornstarch is said to make it more suitable for textile purposes than is the raw cornstarch by giving it properties more nearly approaching starches from other vegetable sources. These soluble or thin boiling starches greatly resemble in appearance the raw starch from which they are made.

Although the use of cornstarch for laundry purposes is decreasing, as shown in Table 19, it is claimed that thin boiling cornstarch is replacing to a large extent wheat and rice starches, which have been used extensively in laundry work in the past. The probable explanation for this apparent contradiction is that there has been a decided change in the starching of laundered clothes. Whereas it was formerly customary for women to wear very stiffly starched long skirts and similarly starched underskirts and for men to wear stiffly starched collars, cuffs, and shirt fronts, shorter dresses with soft finish and soft shirts with soft collars and cuffs are now seen.

These changes in custom might be thought to lead to a decreased use of cornstarch for textile purposes, rather than the increased use shown by the data, but although to-day women's dresses are scantier and contain less starch, women have more dresses than formerly. Also, exports in textiles have increased. The increased use of artificial silk and brighter colored and print goods has also caused changes in the kind of materials used in sizing and finishing.

Starches treated with alkali have become important as adhesives. Alkali starch glues or "vegetable glues" are now used almost exclusively for wood veneering in the manufacture of furniture, wood panels, and other types of woodworking. These vegetable glues have displaced animal glue to a very great extent for such work. Cassava starch is used almost exclusively for the manufacture of vegetable glue and in the manufacturing of dextrin for postage stamps and envelopes, although other kinds of starch can be used. It is asserted, however, that other kinds of starch yield alkali starches which do not give as satisfactory results when used for woodworking.

There is also an increased production of starches which will swell in cold water to form pastes having properties similar to starch gelatinized at higher temperatures.

Although, as previously stated, it can hardly be expected that any one kind of starch will completely displace all other kinds, undoubtedly our increasing knowledge of the properties of starches, changes in fashions, and other economic changes will have their influence on the kind as well as the quantity of starches used in the future.

LOUIS E. DAWSON,
Associate Chemist, Bureau of Chemistry and Soils.

STRAWBERRY Called the A new strawberry of excellent flavor, the Blakemore, is the outstanding result of crosses of the Dual-Purpose Variety Missionary and Howard 17 (*Premier*) varieties made at the United States plant field station at Glenn Dale, Md., in 1923. It is rapidly gaining favor as a market variety because of its firmness, bright light-red color, and uniform shape. It has been tested by the National Preservers' Association and is considered by them as superior to all known commercial varieties for preserving. It has been tested in commercial plantings up to the present time in the strawberry areas from New Jersey to North Carolina and is recommended for that part of the United States. It has not succeeded in the Pacific Northwest, but it should be tested in all regions where the Missionary and the Klondike are grown, as well as in the southern part of regions where the Howard 17 is grown.

Not only has the Blakemore variety shown superior market and preserving qualities, but its characteristics make it well adapted to the present matted-row system of growing strawberries, the method commonly used along the Atlantic coast. It produces plants fully as freely as the Missionary and more freely than the Howard 17. It is more vigorous than either variety, under many conditions at least, and is more resistant to leaf scorch than the Missionary. Limited tests under the hill system indicate that it is also well adapted to that method of culture. Plants kept in hills form many crowns and numerous fruit clusters, hence the production per acre is relatively high under this system.

Has Both Market and Preserving Qualities

The present and prospective importance of strawberry products increases the usefulness of a dual-purpose variety such as the Blakemore. The combination of exceptional market and preserving quali-

ties in one variety enables growers to find more than one outlet for their crop. It is estimated that more than 110,000 barrels of strawberries, or the equivalent of nearly 5,000 cars of fresh berries, were frozen in 1928, chiefly for the preserving and ice-cream industries. The

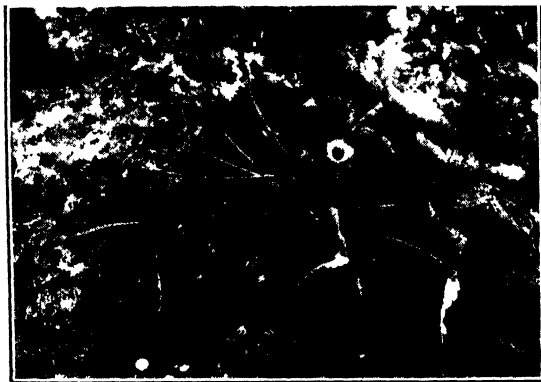


FIGURE 174.—A plant of the Blakemore strawberry at Willard, N. C., producing its "crown" crop. In North Carolina and southward the Blakemore and some other strawberry varieties produce a late spring crop, the "crown" crop, which follows the usual spring crop. This photograph was taken on June 6

freezing of strawberries has increased steadily in importance in recent years. Better preserves can be made from the barreled berries than from fresh berries, so that the fact that the Blakemore lends itself especially well to preserving and is superior to all known varieties for this purpose widens the market for this variety.

Compared with varieties now grown in North Carolina, the season of the Blakemore is about the same as that of the Klondike, a few day earlier than the Missionary, and 10 days to 2 weeks earlier than Howard 17. In Maryland all of these varieties ripen about the same time. The Blakemore has been more productive than the above varieties under conditions so far tested in the area from New Jersey to North Carolina, but may not be as productive under other conditions, especially on very light soils. (Fig. 174.)

Berries of Good Size

The berries are of good size, slightly larger and more uniform in shape than those of the Missionary. They do not have the long point of the Missionary and have a slight neck. (Fig. 175.) The berries are firmer than the Missionary, Klondike, or Howard 17. Their bright light-red color does



FIGURE 175.—Fruit cluster of the Blakemore strawberry illustrating its shape as grown in New Jersey. Note also that all fruits are ripe on this cluster and that none have spoiled

not change on standing, whereas the Missionary darkens quickly, and the Klondike and Howard 17 darken somewhat more slowly than the Missionary. It is an acid berry of the Missionary and Klondike type, though slightly less acid than either. Its easy hulling (capping) qualities, uniform shape, firm and solid flesh, light bright-red color (that

changes relatively little on cooking), and its high pectin content and excellent flavor make it superior for preserving.

The variety is named for Marcus Blakemore, the first president of the National Preservers' Association, in recognition of his public service in connection with the preserved-food industry. The United States Department of Agriculture has no plants for distribution, but plants may be obtained from cooperating nurseries in the areas to which the variety is adapted.

GEORGE M. DARROW,
Senior Pomologist,
GEORGE F. WALDO,
Assistant Pomologist,
Bureau of Plant Industry.

SUGAR-BEET Leaf-Hopper Problem Involves Study of Associated Insects The desert breeding grounds of the sugar-beet leaf hopper in southern Idaho have been the locale for extensive investigations on the biology and behavior of the insect during the past year. In these areas, principally composed of abandoned dry-farm lands, vast areas are given over to the host plants of the insect. In addition to the sugar-beet leaf hopper, large populations of other insect species maintain themselves on these plants. Some of these are of economic importance and others potentially so. The entire insect community living on these host plants has been studied, each species being recorded throughout the season, both as to numbers and host plants. This study is being conducted in the belief that the insects associated on these plants constitute a complex social organization whose separate parts are intimately related to each other, and that no single insect species, such as the sugar-beet leaf hopper, can be properly studied without considering its relationships to other insects associated with it on their common food plants.

Data of this type become increasingly valuable as the record of a series of years is obtained, and are of direct application, not only to the problem presented by the sugar-beet leaf hopper but also to other insect problems of southern Idaho. Since extensive traveling must be done throughout the arid regions of the West in connection with biological studies of the leaf hopper in many widely separated localities, the insects associated with it can be studied in comparatively little additional time throughout a wide geographic range. These studies are aimed primarily at a proper understanding of the leaf hopper's biology throughout its entire economic range, with the hope that the information so obtained will be useful in safeguarding the production of sugar beets. One of these projects is concerned with the mapping of the entire western area with respect to breeding grounds and dispersion areas of the insect. Another is the locating of areas which might, from the standpoint of the leaf hopper, be safe for beet culture. A third activity deals with the discovery of areas which might support the beet industry if information were available as to the years of probable leaf-hopper invasion.

Climate and Weather the Chief Factors

It can safely be said that climate and weather are the two determining factors in the development and abundance of the sugar-beet

leaf hopper. With this in mind there has been attempted a study of the effect of climate and weather on populations of this insect. Again, the data accumulated from the study of the leaf hopper, in relation to the insect community in which it lives, has been the basis for this study, which is expected to show the ebb and flow of the different species of insects in the community, and the association of such changes with certain weather types. With the increase in the length of the series of data on this relationship it will become possible to associate certain weather types with the activity of various species of insects. In so far as these relationships hold true it will be possible to thus lay down a basis for ascertaining in advance the probabilities of insect damage in the case of many species injurious to the crops in the area under consideration. Even species which at present are not known to be of economic importance are well worth study, since, if they do not become of importance to cultivated crops, their reactions to climate may give clues to the activity of economic species whose development and abundance in relation to weather are difficult to determine.

In the case of the sugar-beet leaf hopper, the prediction of outbreaks in the southern Idaho area has now passed its third successful year. Prior to the initiation of this investigation, the acreage of sugar beets was always at a maximum in the years of heaviest leaf-hopper damage. Since predictions have been made this situation has been completely reversed, with the result that the season of 1929 witnessed the largest successful acreage of beets ever grown in the area under consideration.

The predictions of probable leaf-hopper conditions have been issued by the end of February, and, notwithstanding the vagaries of the weather afterwards, the insect situation indicated at the end of February has been confirmed at harvest time. This experience to date has thus provided an excellent demonstration of the practical value of studies on the relation between weather type and insect abundance. An extension of the prediction service is under consideration, and data are being accumulated to permit the prediction of the time and probability of leaf-hopper migrations. This information will be of great value in connection with such other crops as beans, which are susceptible to damage by the insect and which are grown in large quantity in the area under study. Similar studies in other States have indicated that there are other sugar-beet areas which could be benefited by the issuance of predictions of leaf-hopper migrations, and these areas are being studied so that information on this subject will be available whenever needed.

Control Problem Is Complex

The problem of control of the sugar-beet leaf hopper is a very complex one. Direct control measures such as sprays have been tried again, but with disappointing results, since it is extremely difficult to kill the insect before it has had an opportunity to transmit the curly-top virus to the plants. A more fundamental study of direct control measures has been initiated, as it is recognized that the development of successful direct control methods would be of immense benefit to the industry.

Control of injurious insects by introduction of parasites has tremendous popular appeal. In the case of the sugar-beet leaf hopper, search

was made for egg parasites. In doing so the range of the leaf hopper was found to extend a long distance into Mexico, but the egg parasites found there were identical with those already known in the breeding grounds of the leaf hopper in the Western States. Work on the life history of the egg parasites is well under way, and information can be confidently expected to show why the native egg parasites are not more effective. This information will make it possible to again attack the problem of introduction of parasites of the sugar-beet leaf hopper.

WALTER CARTER,
Senior Entomologist, Bureau of Entomology.

SWEETCLOVER Growing by New Methods Is Giving Good Results Sweetclover has so recently been added to the list of important American forage crops that new methods of growing and using the plant are constantly being found.

In the past a serious obstacle to its wider utilization has been its extreme sensitiveness to sour soil. Ordinarily sweetclover does not thrive unless there is plenty of lime in the soil. Since a large percentage of American soils are lacking in lime and are sour, it has become a very general practice to add a ton or more of lime per acre before sweetclover is sown.

Recently there have been indications that on soils which are only slightly sour sweetclover may be grown successfully with a relatively small quantity of lime by drilling the lime with the seed. The method is to mix 400 to 500 pounds of hydrated lime per acre with the seed and sow the mixture through the fertilizer attachment of a wheat drill. Applied in this way, the lime falls close to the seed, where it is immediately available to the seedlings. Apparently the seedling stage is the critical time with respect to lime requirement, and if the seedlings become established the plants thrive. As yet information is incomplete as to the particular soils where this practice is successful, but whenever the lime deficiency is not too great the method is well worth trying.

Occasionally it is possible to dispense with lime entirely by drilling 200 to 300 pounds of superphosphate per acre with the seed. This practice seems to be limited, however, to areas where the surface soil only is sour.

The Double Inoculation Method

Another common difficulty in growing sweetclover has been to obtain good inoculation of the roots. A practice which has been quite successful is the so-called double-inoculation method. With this method both laboratory culture and inoculated soil are used. The seed is first treated with the prepared culture and then mixed with three or four times its bulk of sifted soil from an old sweetclover field. Good inoculation usually follows the sowing of this mixture.

Everyone who has bought sweetclover seed is familiar with the expression "scarified seed." By this is meant seed which has been scratched or scarified in a machine to permit rapid absorption of moisture and quick germination. Scarified seed undoubtedly is the best kind to use when planting in late spring or in summer when

immediate germination is desired. For planting in late fall or winter a better method is to use the unhulled seed just as it comes from the plant. In most of the Central and Eastern States unhulled seed scattered on a frozen wheat field in January or February has proved to be one of the cheapest and most reliable methods of obtaining a stand. In experiments at the Arlington Experiment Farm, Rosslyn, Va., during the last seven years unhulled seed planted any time between December 15 and February 15 has produced an excellent crop. The seed germinates at the first suitable opportunity in spring, and the young plants obtain a good start while the soil is still cool and before the weeds are well started. Scarified seed can not be safely used for winter planting, because it germinates before danger of killing frosts is past. In the semiarid regions winter planting with

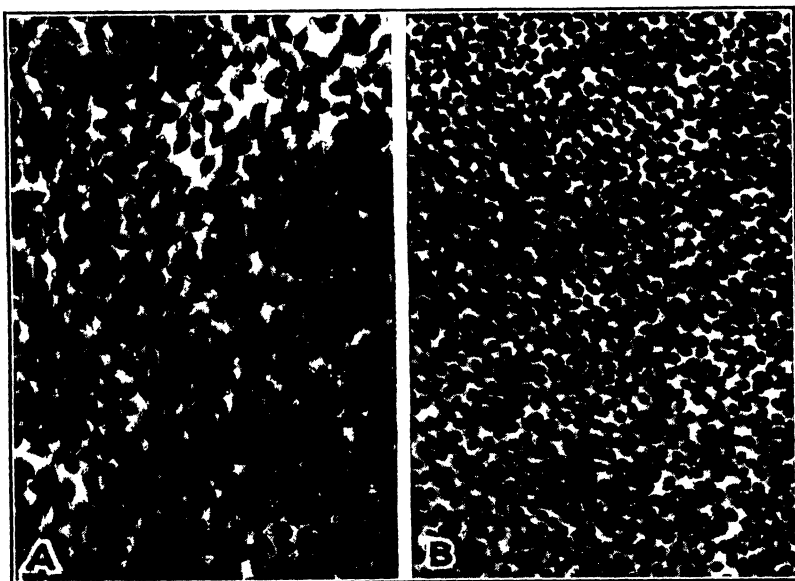


FIGURE 176.—Sweetclover seed, natural size; A, unhulled seed; B, hulled seed

unhulled seed has not been uniformly successful, because the rapid early growth sometimes exhausts the reserve moisture in the soil before midsummer. Unhulled seed may be produced easily and cheaply at home by the use of a seed harvester of the beater type made from an old binder.

Difficulty in Making Sweetclover Hay

Sweetclover hay is often troublesome to make, owing to the difficulty of curing the heavy green stems. Farmers are getting around this difficulty by cutting the hay with a binder. The bound bundles are set up in long, narrow, open shocks like oat shocks and allowed to cure for several days. The quality of the hay thus produced is good, and the expense is little greater than for hay cocked by hand.

In regions where much sweetclover is used for pasture there is an increasing tendency to sow some kind of grass with it. Orchard grass, timothy, redtop, and (in the South) Bermuda grass are the most

popular sorts. There are several advantages of a grass-sweetclover mixture. The grasses fill the vacant spots where the sweetclover failed to catch and thus increase the yield of forage. They give variety to the diet, lessen the danger from bloat, and extend the pasture season at both ends of the year. On soils which heave badly in late winter the grass roots tend to bind the surface soil together and lessen the serious slippage of sweetclover roots.

When grass can not be sown with the sweetclover, a growing practice is to plant a small field of Sudan grass near by. This serves as a reserve pasture to protect the new seeding of sweetclover from overgrazing and also provides late pasturage after the old sweetclover pasture is mature.

Danger of Livestock Bloating

During the last five years there have been an increasing number of complaints of animals bloating on sweetclover pasture. The increase is not out of proportion to the increased acreage of the crop, and sweetclover is still believed to be less likely to cause bloat than alfalfa, red clover, or most other legumes. Nevertheless, bloating on sweetclover does occur, and reasonable precautions to prevent it are necessary.

Bloating is usually due to animals gorging themselves on green, succulent feed. One of the best preventives, therefore, is to make sure that the animals are not turned into a sweetclover field while hungry. When cows are brought into the barn to be milked they should be given some hay, silage, or grain before returning to the pasture. Animals that stay on a sweetclover field continuously should have access to hay, straw, or growing grass in addition. In districts having soft water, lime should be put in the drinking water. Even with these precautions the animals should be watched rather closely during May and early June, when the herbage is most tender, and preparations should be made to give immediate treatment with a trocar or some vomiting agent if necessary.

L. W. KEPHART,

Senior Agronomist, Bureau of Plant Industry.

SWEETPOTATOES

High in Food Value
and Vitamin Content

Sweetpotatoes have been used as an article of human food for centuries. Ranking second in importance as a truck crop in the United States, they constitute one of the chief vegetable foods in the Southern States. About 1,000,000 acres, with an approximate farm value of \$80,000,000, are devoted to the annual commercial production of sweetpotatoes in the United States. In addition, the quantity produced by truckers and small farmers and home gardeners nearly equals that produced commercially.

Sweetpotatoes are primarily an energy-producing food. The edible portion of raw sweetpotatoes has an average fuel value of 570 calories per pound. Besides containing an average of about 18 per cent starch, they also have from 4 to 5 per cent sugar. The percentages in different varieties and in different samples of the same variety vary within wide ranges. A characteristic feature of

sweetpotatoes is that they are naturally rich in diastase, a substance that changes starch into sugar. At ordinary temperature the diastase in the sweetpotato shows but little activity, but at 55° to 65° C. the sugar formation, although not instantaneous, is extremely rapid. Frequently when sweetpotatoes are cooked nearly all the starch is changed into sugar (maltose). Sweetpotatoes as used for human food are, therefore, really a saccharin food, rather than a starchy food.

Protein Content of Sweetpotatoes

As compared with other root vegetables, sweetpotatoes rank high in protein, containing an average of about 2 per cent. Some varieties contain more than 3.5 per cent. Although low in protein as compared with seeds, sweetpotatoes as a nitrogenous food have a significance in nutrition beyond that judged merely on the quantity of the crude protein they contain. In nutrition the quality of a protein must be considered as well as the quantity. Recently the proteins of sweetpotatoes were isolated for the first time, and studied in the protein and nutrition division of the Bureau of Chemistry and Soils. These proteins were found to be a good source of some of the amino acids which are known to be essential for the growth and satisfactory nutrition of animals, and which are lacking or deficient in the proteins of certain seeds and grains. For this reason sweetpotatoes should be a valuable supplement to correct the deficiencies of proteins of corn, wheat, and grains in general, and several of the legume seeds, such as the navy bean, lima bean, cowpea, and lentil.

Sweetpotatoes are richer than potatoes in true protein. Sweetpotatoes and potatoes are usually represented as containing about the same percentages of protein. These percentages are calculated by multiplying the nitrogen content of the material by the factor 6.25. About half, or less, of the nitrogen in potatoes, however, does not represent protein at all, but is present in the form of amides which do not have the food value of proteins. No amides have been found in sweetpotatoes.

Vitamin Content of Sweetpotatoes

The vitamin content of sweetpotatoes is an important consideration in their food value. With the exception of carrots, sweetpotatoes are distinguished from other commonly used edible roots and tubers by their high content of vitamin A. They contain enough vitamin A to justify classifying them with the leafy vegetables as a source of this vitamin. In agreement with many observations that vitamin A in natural products is usually associated with yellow or green pigment, it has been shown that yellow sweetpotatoes contain much more vitamin A than the white varieties. Sweetpotatoes are also a good source of vitamin B (using this designation in the sense of the old terminology) and vitamin C. They contain more vitamin B than many other root crops and compare favorably with those that contain the most. As a source of vitamin C it has been reported that sweetpotato juice has an antiscorbutic value equal to about one-third that of orange juice and about one-half that of peach and pineapple juice. Sweetpotatoes, therefore, can serve as a convenient source of antiscorbutic food when fruit and green vegetables are not readily available. Allowances should be made, however, for loss of vitamins in cooking.

Can Be Preserved as Meal

It has been shown that when properly dried, sweetpotatoes can be ground into a meal or flour which can be preserved indefinitely and which does not lose its flavor when used in making pies and custards. Work done in the Bureau of Chemistry and Soils has demonstrated that sweetpotato flour can be used as a bread improver. A substantial increase in loaf volume occurred when sweetpotato flour was used with wheat flour. One and one-half per cent of sweetpotato flour seemed to give the best results. The texture of the bread, color, and flavor were up to the standard.

A process has also been worked out in the Bureau of Chemistry and Soils for the manufacture of sweetpotato sirup.

Aside from serving as an important article of human food, a significant percentage of the sweetpotato crop is fed to farm animals, especially hogs. There is need of a cheaper and more productive source of carbohydrates than corn for feeding purposes, particularly in the Southern States. Cottonseed, peanut, and soybean meals supply an abundance of protein, but on account of lack of enough carbohydrate material the southerner is likely to be restricted to feeds that contain too much protein in proportion to carbohydrate. Such feeds are not only expensive but do not constitute the most efficient ration. Scarred and cull sweetpotatoes could be used to advantage for feeding purposes, particularly during the early part of the season when the question of storage would not have to be considered. Sweetpotato vines are also of high nutritive value and are much relished by livestock.

D. BREESE JONES,

Principal Chemist, Bureau of Chemistry and Soils.

TAX Measurement Is a Complex Job Involving Many Obscure Factors

Measurement of the burden of taxes on farm property or any other type of property is no easy task. The best single means of measuring the burden is found in a comparison of the taxation and the income of the property or the individual that is taxed. Other means of computing tax burden should be considered, but they are of lesser importance.

Taxes on agriculture are largely taxes on farm property. It has been estimated that of the \$900,000,000 of taxes which are directly paid by farmers, 84 per cent consists of taxes on tangible farm property. More than 75 per cent of these taxes on tangible property are levied on the land and buildings of the farms. Hence the measurement of the weight of taxation on this property gives a valuable indication of the way in which agriculture is burdened by taxation.

It is not difficult to discover the amount of taxes paid by any piece of farm land. It is a matter of public record and may be ascertained by consulting the books of the proper official. An attempt to discover the income produced by any piece of farm land is less easy. A farmer operating his own farm may be able to state accurately the total net income which he receives from the farm; but when he attempts to separate this income into parts to be assigned to him for his labor and for his managerial ability, and to the land for its part in produc-

tion, he finds that such separation can be made only on the basis of arbitrary assumptions which may be satisfactory in individual cases, but which will not be generally accepted.

Net Income of Rented Land

In sections where a considerable quantity of land is rented for farming purposes the net rent which may be received by the owner of the land represents the income from land and, particularly when the land is rented for cash, little else. It is not difficult to compute the net income of rented land. In the case of real estate rented for cash, depreciation and taxes are usually the only important items to be deducted from gross rent in order to arrive at the net return. In the case of share rent, additional expense items must be subtracted from gross rent. These depend on the local renting contracts and vary from one section to another. Their amount can be computed accurately by the farm owner. In some areas the landlord who rents on shares spends some of his time supervising the use of his land. The value of his time should be one of the deductions from gross rent. In sections in which studies of rent and tax have been conducted this item has been of small importance and has not been considered except in unusual cases. Share-rent figures are dependent on the yields and prices of a particular year and so are subject to wide variation from year to year. Over a period of years, however, these variations tend to counterbalance one another.

Studies in 14 States

Studies of the net return to the landlord on rented farms were made in 14 States for one or more years during the period from 1922 to 1927. A comparison of the taxes with the net rent gives the basis for measuring the weight of taxation. Figure 177 contains such a comparison. The first item which appears in the figure is the number of dollars of net rent received by the landlords after deducting all charges, including taxes and depreciation. Pennsylvania farms reported \$4.96 per acre as net return on the farms included in the sample. These farms are largely located in the better farming sections and do not supply data which are as typical of conditions in the State as a whole as do the figures from other States. Iowa farms reported the next highest average net rent, \$3.36 per acre. Then came Missouri, Arkansas, Ohio, Indiana, South Dakota, and New Jersey, each with net rent per acre averaging over \$2. Washington, Virginia, and North Carolina farms reported net rent from \$1.50 to \$2 and North Dakota, Colorado, and Michigan reported figures between \$1 and \$1.50 per acre.

Neither rent nor tax figures on a per-acre basis are significant if they are taken by themselves, but the comparison of the average taxes per acre paid on the farms in the various States will be of interest in illustrating the varying fixed tax charge which must be met by an acre of land in various sections of the country. The highest tax figure was reported in New Jersey, where the average was \$2.07 per acre. Pennsylvania, Ohio, and Indiana farms paid taxes of \$1.76, \$1.62, and \$1.50 per acre, respectively. Michigan and Iowa were the only others of the 14 States in which the taxes were over \$1 per acre. Virginia, Arkansas, North Dakota, and Colorado reported taxes of 60 cents per acre or less.

The Relationship of Rent to Taxes

The signif. ant part of this discussion concerns the relationship between net rent before taxes are deducted and the taxes that the owner must pay. The States which supplied the material in Figure 177 are arranged in the order of the percentage of net rent (before deducting taxes) which was taken by taxes in the years covered by the investigations. Michigan is at the top of the list. Taxes there during the years from 1923 to 1926, inclusive, took 58 per cent of the net rent

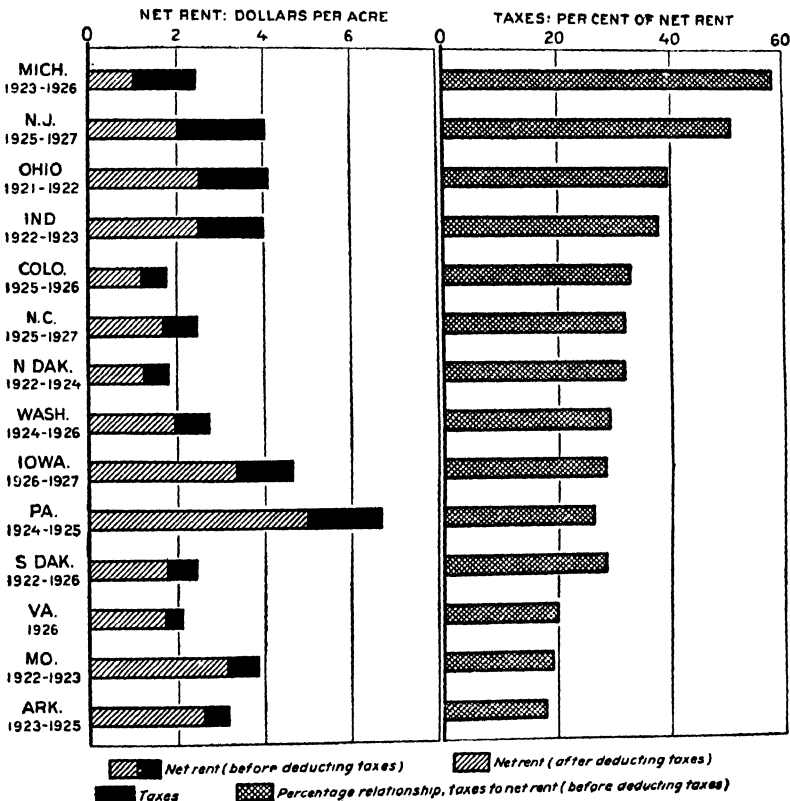


FIGURE 177.—General property tax and net rent on selected farms in 14 States in selected years, 1921-1927

received by the owners of the rented farms. New Jersey, where taxes took 51 per cent of the net rent, was a close second. In Ohio and Indiana taxes took 39 and 38 per cent, respectively. In three States—Colorado, North Carolina, and North Dakota—taxes amounted to between 30 and 35 per cent of net rent.

Thus in half of the States for which data are available taxes amounted to over 30 per cent of the net income which the landowner received from his land. Four States—Washington, Iowa, Pennsylvania, and South Dakota—reported that taxes averaged from 25 to 30 per cent of net rent. In Virginia the percentage was exactly 20, and in Missouri and Arkansas the percentages were 19 and 18, respectively.

There seems no reason for believing that the extension of this study to the 34 other States would indicate a much wider range of conditions or that the results from the additional States would materially change the general conclusions that may be drawn from the data presented. On the average, slightly more than 30 per cent of the rent which the farm owner receives, and from which he has deducted all the legitimate charges except taxes, must be used to pay the tax bill.

Personal Ability to Pay

Relationship between the taxes and the income of property does not tell all that one needs to know about the burden of taxation. Taxes are levied on property but they are paid by persons. A full understanding of the problem would necessarily include consideration of personal ability to pay taxes as well as the ability of property income to bear such taxes. The two may differ, although in the case of farm property and its owners there is undoubtedly less difference than in the cases of most other types of property and their owners. Benefits from taxation need to be considered before the tax burden can be fully measured. Farm property and farm persons almost universally receive less benefits than do their urban counterparts. There are other qualifications of the method used to measure tax burden, but they would not materially alter the conclusion that income from real estate, and in particular from farm real estate, bears a tax burden that is relatively much heavier than that borne by income in general.

WHITNEY COOMBS,
*Senior Agricultural Economist,
Bureau of Agricultural Economics.*

TEA Not a Reliable Source of Vitamin C, Nutrition Tests Show

Recently Japan green tea has been exploited by advertisers as a source of vitamin C. It is a well-known fact that the green leaves of many plants are excellent sources of this vitamin, and no great amount of imagination was required to conceive the idea that the leaves of the tea plant might contain this important food factor. Furthermore, this idea was all the more attractive because we are accustomed to thinking of tea as a beverage of social and psychological importance but of very little nutritional value. Even though the fresh green tea leaves contained vitamin C, there still would be the possibility that this factor might be destroyed when the leaves are dried or when the tea infusion is made.

Tests on Vitamin Content of Tea

During the last year experiments to determine the vitamin C content of tea as it is ordinarily drunk have been carried out in the Bureau of Home Economics in cooperation with the Food, Drug, and Insecticide Administration.

Vitamin C is necessary in the diet of most animals, and if it is absent scurvy will develop. Therefore the presence of vitamin C in any food is detected by feeding this food as the sole source of this vitamin in the diet and noting whether the symptoms of scurvy develop. If scurvy does not develop it may be assumed that the food being tested fur-

nishes vitamin C, whereas if scurvy does develop we are justified in assuming that there is no vitamin C in the diet. Such tests are reliable only when they are carried out under carefully controlled conditions on large numbers of animals.

In the present investigation 49 guinea pigs were used and four samples of tea were examined. A tea infusion made according to the standard method was given to the guinea pigs, and control animals were given orange juice—a food known to be rich in vitamin C. The results of these experiments showed that about one-fourth teaspoon of orange juice each day is enough to furnish all of the vitamin C needed by a growing guinea pig, but seven and eight times this amount of tea infusion failed to prevent the development of scurvy. In fact, only one sample supplied enough vitamin C to enable the animals receiving it to live the entire 90 days of the experiment.



FIGURE 178.—Guinea pig fed orange juice as the sole source of vitamin C in the diet



FIGURE 179.—Guinea pig fed tea infusion as the sole source of vitamin C in the diet

Even then they showed severe signs of scurvy at autopsy, which was proof that the amount of vitamin C present was of no practical significance.

Figure 178 shows a guinea pig that grew well on a daily allowance of one-fourth teaspoon of orange juice as the only source of vitamin C. This guinea pig is of normal weight and is healthy and alert. In contrast to this is the emaciated

and scorbutic condition of the guinea pig shown in Figure 179 which was given about 2½ teaspoons of tea infusion daily as the only source of vitamin C.

There can be no doubt that green tea is a poor and unreliable source of vitamin C even when consumed in relatively large quantities.

HAZEL E. MUNSELL,

Senior Nutrition Chemist, Bureau of Home Economics.

TICK Eradication Is Making Rapid Gain in Florida

The whole coastal-plain region is watching with interest the fight being waged in Florida to eliminate the cattle-fever tick, for it is in Florida that this disease-spreading parasite is making its last stand on the Atlantic coast, and cattle owners will not feel entirely safe until the danger of reinfestation is removed.

The cattle-fever tick, like many other parasites injurious to agriculture, is an invader from overseas. In all probability this parasite was introduced into Florida by importations of ticky cattle during the early Spanish colonization of this territory. It is generally conceded that the tick spread throughout the South from this region until an area approximately the same as the Cotton Belt of the South became infested. Climatic conditions in this area permitted the propagation of ticks, while further north they could not survive the winter cold.

There were 15 States in whole or in part originally infested and in quarantine, and although Florida was possibly the first State to feel the stigma of the fever tick she has been among the last to undertake its eradication.

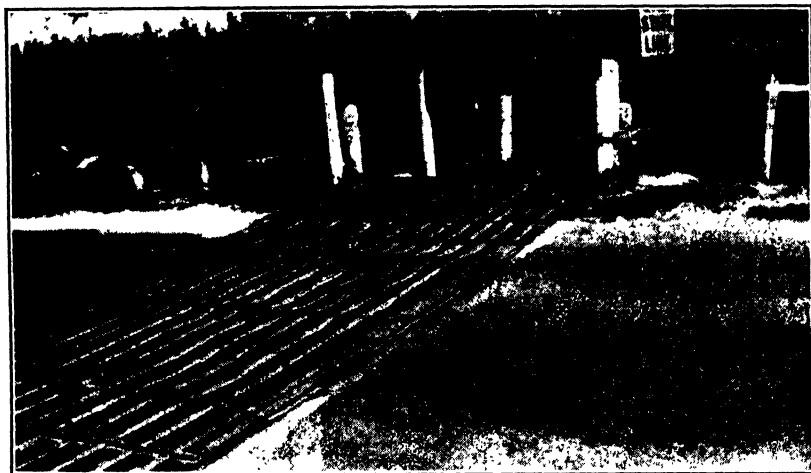


FIGURE 180.—A cattle guard at Georgia-Florida State line. Note double fence which has enabled Georgia to prevent reinfestation of her border counties from tick-infested territory in Florida

Northern Markets Closed Against Ticky Cattle

When the cattle owners of the South and others interested in the cattle industry there saw the markets in the tick-free areas closed against them and realized that southern cattle were not wanted there and elsewhere, they decided to eradicate the ticks.

Climatic conditions in Florida permit systematic dipping at practically all seasons of the year, but many cattlemen in Florida contended that their open ranges covered with palmetto scrub, swamps, and dense forests could not be made tick free because they believed all cattle could not be systematically dipped every 14 days.

Georgia, although under similar topographical difficulties, accomplished tick eradication and in order to remain tick free, imposed an embargo against Florida ticky cattle. This action controlled shipments, but the State line between Georgia and Florida was largely unfenced piney woods, and Florida cattle ranged into Georgia, causing reinfestation along the border counties. Thus it became necessary, in the enforcement of this quarantine, for Georgia to take further steps. To prevent Georgia cattle from drifting into tick-infested Florida and returning infested, and to stop Florida cattle from roaming across the State line into Georgia, Georgia constructed cattle-proof fences along her southern boundary. (Fig. 180.)

Barred from Georgia and Alabama on the north, and surrounded by water on the other sides, Florida found herself without an adequate market for her cattle. Her ranges soon became overstocked with tick-infested cattle, and she realized that something had to be done to enable the cattle owners to dispose of their surplus stock. In 1923 the State legislature, in response to a stimulated interest in tick eradication, enacted a practical law based on the experience of other States and provided funds to carry out the work of tick eradication in cooperation with the Bureau of Animal Industry, United States Department of Agriculture.

Prior to this legislation four counties in the southern part of the peninsula had eliminated the tick largely by voluntary action on the part of progressive dairymen and had introduced cattle of the better breeds, establishing a dairy industry creditable to any State. With this example to prove to cattle owners the value of tick eradication and a good law, providing funds and dividing the State into zones to complete the work, the State and Federal Governments, in cooperation with the cattlemen, organized their forces for the campaign against the tick. The work is now in progress.

Cattle Are Being Improved

In Florida the beef and dairy industries are becoming more alert to the many advantages of the introduction of purebred sires. In the area first freed of the tick, contiguous to Miami and Palm Beach, as fine dairy herds as may be found elsewhere in the country have been established, proving that this southern region is admirably adapted for improved livestock.

In northern Florida, where the tick has been eradicated more recently, there is an almost constant influx of purebred bulls. (Fig.

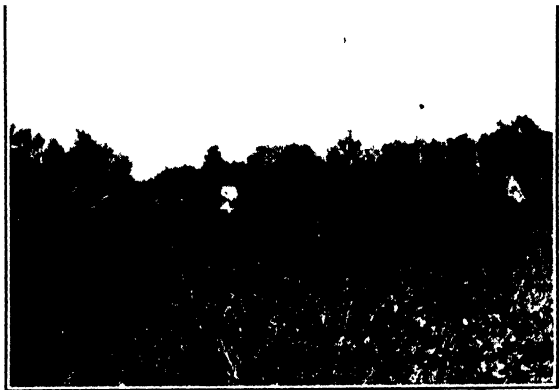


FIGURE 181.—Florida scrub cows with first-cross calves of beef breeding

181.) From Pensacola in the extreme western part one can drive eastward for 350 miles almost to Jacksonville, remaining wholly within a tick-free portion of the State. Cattlemen in every county in this area are awakened to the potential advantages of a profitable cattle industry. At present, this vast area is primarily a beef-cattle section and hundreds of purebred beef bulls have been introduced, but only a start has been made. Both Federal and State agencies are rendering assistance in this livestock-improvement work. The climate is favorable for growing livestock without expensive shelter; soils and topography are suitable; climate and rainfall are almost ideal. Luxuriant pasturage can be established by seeding to pasture grasses, many of which thrive abundantly. Carpet grass, Lespedeza, and other excellent grasses are

indigenous to the soil where the custom of burning woods and pasture is abandoned. Unlike some of the western ranges, good natural water facilities are nearly always available.

Promising Fields for Dairy Development

The close proximity of Florida to northern and eastern markets affords a ready market for livestock at all seasons, and with approximately \$25,000,000 worth of dairy products brought into the States annually, a great field has been opened for dairying in the area free of ticks. By improving the quality of beef cattle in parts of Florida recently made tick free, a vast area is opened up from which northern and western feeders may obtain suitable cattle for feeding and grazing purposes. Breeders of purebred cattle have found in the same parts of Florida a ready market for their breeding cattle, particularly bulls.

The last few years have wrought far-reaching changes in Florida's tick-eradication program. At first there was considerable opposition by misguided persons, but more recently there has been a phenomenal growth in public favor and appreciation of the work. At the close of the calendar year 1929 Florida was over 44 per cent tick free, with systematic eradication in progress in an additional 8 per cent. In addition, five counties were building dipping vats and making the necessary arrangements to start work in the spring of 1930. The cattle-fever tick can not be regarded as a permanent foe to the cattle industry in Florida. The work of tick eradication will gain impetus as more counties are freed from tick infestation, until the whole State will be tick free, paving the way for more and better cattle without quarantine restrictions.

T. W. COLE,

Associate Veterinarian, Bureau of Animal Industry.

TIMBER and Cattle Can Be Raised Together on Southern Cut-Over Land It is generally estimated that there are in the coastal-plain belt of the Southern States at least 25,000,000 acres of idle lands, which were at one time covered with magnificent forests. That they are not now producing another crop of timber can be laid to destructive lumbering and widespread occurrence of fire. In recent years a few landowners have taken an interest in growing new crops of timber on their cut-over lands and some are considering the possibilities of combining cattle raising with reforestation. Whether this will be feasible or not is being worked out in an experiment that has been in progress since 1923 at the coastal plain experiment station at McNeill, Miss., and carried on jointly by the Southern Forest Experiment Station of the Forest Service, the Bureau of Animal Industry, and the Bureau of Plant Industry.

A tract of 320 acres in Pearl River County, Miss., was fenced in 1923, on land from which the original longleaf pine had been logged about 1902 or 1903. Between the time of logging and fencing the land was open to grazing by both cattle and hogs and the dead grass was burned off nearly every winter. The fenced tract was divided into two 160-acre plots. One of these has been burned over each year since 1923, during the winter time, while the other 160-acre plot has been protected from fire. In each of these two larger plots a 10-acre check plot

has been fenced against grazing. (Fig. 182.) On the 300 acres, cattle grazing has been permitted during the spring and summer (April 15 to November 15 approximately) at the rate of 10 acres per steer. This arrangement has resulted in four distinct conditions: (1) One area grazed and burned (150 acres); (2) one area grazed but not burned (150 acres); (3) one area burned but not grazed (10 acres); and (4) one area neither burned nor grazed (10 acres).

In each of these areas small plots were measured off and staked out for an intensive study of the seedlings of long-leaf pine which came up. These seedlings were counted and mapped before and after burning.

Early in 1928 it was found that on the plot protected from both grazing and burning, 82 per cent of the seed crop of 1924 had survived. It seems reasonable to believe that these 3-year-old seedlings—about 13,000 to the acre—will show little mortality from now on. On the ungrazed plot which was burned every year, only 17 per cent of the



FIGURE 182.—The area at the left is protected from both fire and grazing, while the one at the right is protected from grazing but is burned over annually according to local practice



FIGURE 183.—The area to the left of the fence includes the experimental plots and is protected by a fire line on the outside of the fence. Land to the right of the fence is an example of burned and cut-over land

original 1924 seed crop had survived. On the unburned and grazed plot 70 per cent of the original stand survived. On the burned and grazed plot only 24 per cent of the seedlings were alive. (Fig. 183.) It seems, therefore, that the damage caused by grazing itself has been

relatively slight. On areas protected from fire, the grazing accounted for a reduction of only 12 per cent in the number of seedlings.

Experiment Applies Only to Native Grasses

Thus far the experiment seems to indicate that cattle grazing and timber growing can be practiced on the same land, particularly where fires are prevented. It should be mentioned, however, that these results apply only to native grasslands where the predominating forage grasses are broom grass (*Andropogon scoparius*) and wire grass (*A. tener*). On improved pasture grasses such as carpet grass (*Axonopus* sp.) practically all longleaf seedlings are killed by the close grazing which ordinarily results. It was found that an average of only 1,000 out of 107,000 longleaf seedlings per acre survived grazing on carpet-grass areas over a period of two years.

Preliminary conclusions drawn from this experiment indicate that cut-over pine lands with an ample stocking of seed trees (about 12 per acre) will restock naturally to longleaf pine when given protection from fire and hogs. Until the trees are of merchantable size the same land can be profitably utilized for grazing by cattle, provided of course that injury due to overgrazing is guarded against. It is believed that the optimum stocking to cattle on such areas will approximate one head to 7½ acres of reforesting land.

L. J. PESSIN,
Associate Forest Ecologist, Forest Service.

TIMBER Waste Large in the Northwestern Douglas-Fir Forests

The Forest Service completed in 1929 a survey in the Douglas-fir region of western Oregon and Washington to ascertain the quantity and character of wood waste annually left after logging. There is probably more unutilized wood left per acre in this region, excepting possibly the redwood belt of California, than in any other lumbering section. (Fig. 184.) The survey showed that the annual accumulation of material of cordwood size and larger now being left unused after logging amounts to 3,088,748,000 feet log scale or 6,177,496 cords of sound wood. In footage this is equal to almost one-tenth of all the lumber annually produced from timber native to the United States.

In 1926 the total pulpwood cut in the United States was 5,489,517 cords. More than one-third of the wood waste left after logging in this region—1,146,276,000 feet or 2,292,252 cords—is western hemlock (fig. 185), Sitka spruce, and true firs, woods in demand for sulphite and mechanical paper pulp. The remainder is Douglas fir, western red cedar, and other species with high lumber values but low pulping properties at present. More than half of all the logging waste—1,626,547,000 feet—is Douglas fir. (Fig. 186.)

Material Listed as to Size

The survey listed the material, as to its size, character and species, into saw logs, excessively high stumps, pulpwood, fuel wood, shingle bolts, poles, and fence posts. From the saw logs, as a rule compara-

tively small or short but such as in other regions would usually go into lumber, it was found that about 1,483,526,000 board feet of lumber could be manufactured. The excessively high stumps, if added to the butt logs of the trees when they were cut, would saw out 231,563,000



FIGURE 184.—Young timber knocked down and left by loggers. In most other regions timber of this size is merchantable. In the Douglas-fir region small logs can not be handled profitably with the huge logging machinery which is commonly used

board feet. The pulpwood from material too small or unsuitable for saw logs would make 755,506 cords (pulping species only). The total annual timber volume used by the paper-pulp mills of the region is calculated at about 484,000 cords. On the basis of the census figures for 1926, most of the pulp turned out on the Pacific coast is from western hemlock, Sitka spruce, and true firs. A little Douglas fir is



FIGURE 185.—Four examples of western hemlock. A large-sized top in the foreground; a broken log; a stump that is cut too high; and standing trees of small size. All will be burned by the slash fires which are set at seasonable periods after logging as a precautionary measure

used. If economical processes for making suitable kraft and white paper from Douglas fir should be perfected, more of this species would be used by pulp mills, and a great deal of Douglas-fir logging waste too small or unsuitable for saw logs would be available for pulp making. This material, listed by the survey as fuel wood, amounted to 1,674,102 cords.

Most of the western red cedar logging waste was listed as shingle bolts, telephone poles, and fence posts. There was enough to make each year 4,914,103 shingle bolts (nearly 1,000,000,000 shingles), 176,000 telephone poles, and 7,589,429 fence posts.

The survey developed the fact that as a general average 21,407 board feet per acre of sound material, cordwood size and larger, is left on the ground as logging waste. This is equal to almost one-fifth of



FIGURE 186.—Douglas fir logs, broken and left in the woods. Broken logs in number and volume make up the greatest amount of the logging waste. Note the fine log in the center of the picture, which was broken by felling a tree across it

the original stand of timber. In many parts of the world a forest averaging 21,000 board feet, or 42 cords, of wood per acre would be considered a very heavy stand of timber.

A. H. HODGSON,
Forest Examiner, Forest Service.

TOBACCO Diseases Are Largely Controllable by Sanitary Measures

Diseases of tobacco annually exact a heavy toll from the potential profits of the growers and not infrequently cause practical crop failures. During the last decade, in particular, tobacco diseases have become much better understood than formerly, and it should now be recognized that much of the loss caused by them is preventable. In many cases merely the exercise of some precautionary measures may suffice to hold the disease in check. The adoption of sanitary measures of control is destined to become one of the regular and important practices in tobacco culture.

It is naturally essential to success in control practices that the measures be applied at the time when the parasite is most vulnerable to attack, and this time is usually before the sowing of the seed or the planting of the crop.

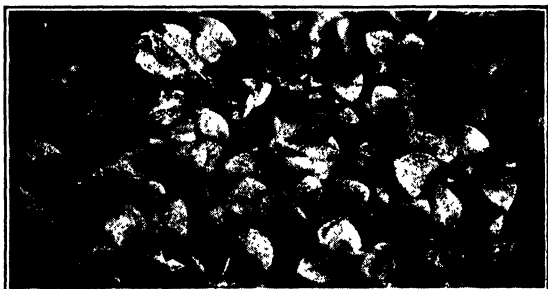


FIGURE 187.—The production of disease-free plants such as these should be a primary consideration with tobacco growers. The presence of leaf spots of wildfire or black fire may result in a badly rusted crop in the field

The production of healthy tobacco plants for transplanting should be the first concern of the grower. Early vigorously growing plants are not necessarily healthy. They may, in fact, harbor a disease which may finally ruin crop prospects in the field. Several of the most serious field diseases of tobacco originate in the plant beds, often on plants that do not appear to be seriously affected. These diseases not only endanger the crop planted from such beds but may serve to start a center of infection in the soil with the setting of each plant and in consequence result in infection of succeeding crops.

Seed-Bed Sanitation

Recently attention has been attracted to the importance of tobacco seed-bed sanitation, because some of the most serious rust diseases of tobacco, especially wildfire and black fire, invariably originate in the plant beds. Their control is almost entirely dependent upon the adoption of sanitary measures in the preparation and management of plant

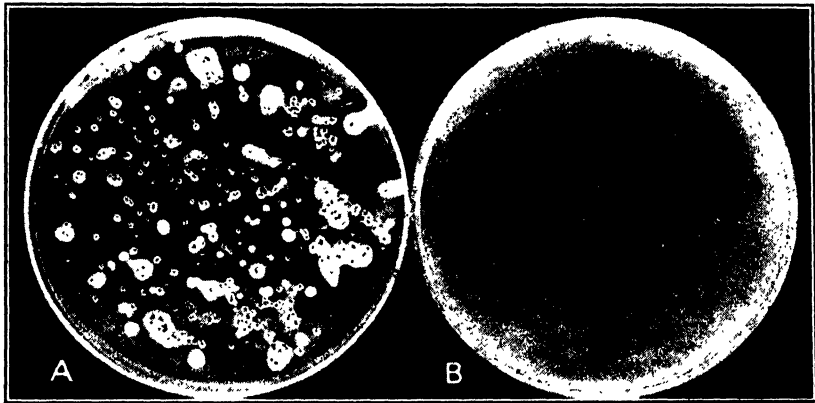


FIGURE 188.—Tobacco seed may harbor parasites, as is shown by the white growth around the seeds in A. Such seed can be thoroughly disinfected, as is shown by the germinating seeds in B

beds. But a number of other maladies may originate in the seed beds as well as in the field. Among these are such well-known diseases as mosaic, black root rot, root knot or the nematode disease, and black shank. The tobacco seed bed may consequently be a veritable base of dissemination for all sorts of diseases and the transplanting of plants from seed beds showing signs of disease should naturally be done with caution if done at all.

Infections in the seed beds may arise from a number of different sources, and every practicable precaution should be taken to prevent the introduction of parasites into the beds. First of all, the location of the plant beds must be considered with respect to the danger of infection from infested soil or from surroundings such as adjacent buildings harboring infested refuse from preceding crops. Refuse from cured rusted crops in particular should be carefully raked up and disposed of by burning or burying. The field refuse and stubble from such crops should be plowed under as soon as feasible. Naturally, no tobacco refuse of any kind should be used on seed beds for fertilizer, insecticidal, or other purposes. Seed-bed frames, sash, or cloth should not be stored in curing barns. If such equipment has previously covered

infected plant beds, it should be either discarded or disinfected with heat or corrosive sublimate before use.

Method of Disinfecting Seed

Black fire and wildfire may also be introduced in the seed bed through infested seed which has been grown in affected fields. If such seed is to be used, it should be disinfected by treating for 5 to 10 minutes with a silver-nitrate solution (1 part silver nitrate to 1,000 parts water), followed by rinsing in pure water. It seems likely that seed disinfection may become a standard practice in the near future, since this simple and cheap procedure, together with the precautionary measures suggested above, will aid in insuring the crop against damage from wildfire and black fire.

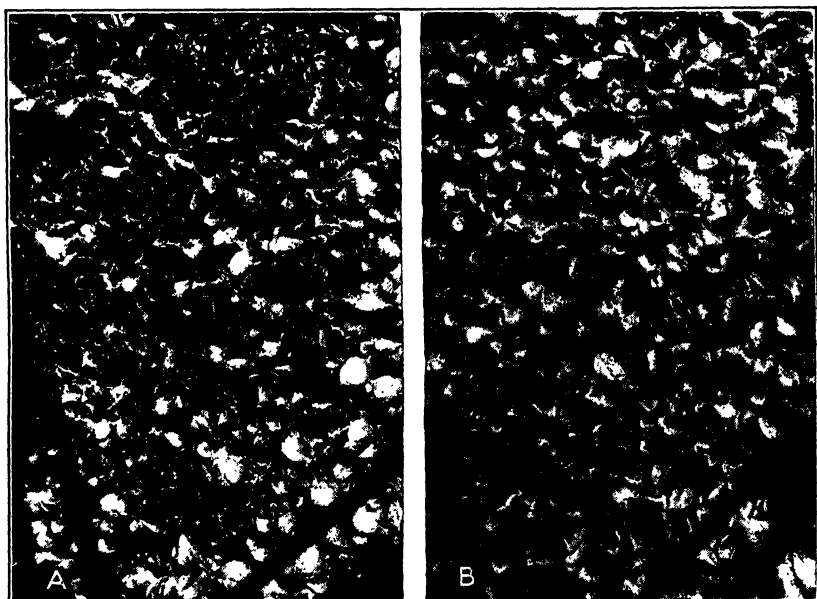


FIGURE 189.—When wildfire-contaminated seed is sown, plants may die down in seed beds as shown in A. The same seed disinfected with silver nitrate will yield plants as shown in B

Sterilization of the soil by steam, already generally adopted in some tobacco districts, is a sanitary measure of considerable value in the prevention of such diseases as are commonly harbored over winter in the soil. To be of real value, the process should be properly done both with respect to the condition of the soil at the time of steaming and the length of time of steaming.

Various other precautionary and sanitary measures applicable to field conditions as well might be suggested, such as avoiding infested soils and checking unnecessary spread of disease in the fields by the workers. Some broader aspects of the question present themselves, however, which are more difficult to handle. These relate to the danger of dissemination of serious diseases throughout an entire community or district through the indiscriminate planting and transporting of diseased plants from farm to farm. Here are problems involving sanitation, and possibly even quarantine, well worthy of

the most serious consideration of those who have the welfare of the industry at heart. At present it seems only feasible to advise growers to refrain from planting such plants or from using such other insanitary methods as may jeopardize not only their own crop prospects but those of others in the community as well.

JAMES JOHNSON,
*Agent, Tobacco-Disease Investigations,
Bureau of Plant Industry.*

TOBACCO Grading Cuts Handling Costs and Gives Trade Confidence A predominant portion, 86 per cent, of the tobacco consumed annually in the manufacture of cigarette, chewing, and smoking tobacco is sold

directly by the farmer to the manufacturer at auction warehouses, located at large or small cities in the tobacco-producing areas from the banks of the Ohio River southward. Cigar tobacco is not sold at auction.

The auction method of selling tobacco possesses certain advantages, but likewise certain defects are apparent, and efforts to eradicate those defects have led to a new development in tobacco marketing.

Each of the large tobacco manufacturers has his own grading system developed according to the needs of his own business and has his own series of private grade marks. No two systems are alike. Each manufacturer instructs his buyers the grades to buy and the average price to pay. The transactions are made on the basis of the buyer's private judgment of grade, arrived at from an extremely brief inspection of each pile of tobacco. The farmer does not know the different grade systems, the distinction between grades, or the grade basis for the price he receives. Therein lies his disadvantage. Lacking expert knowledge of tobacco classing, he must sell to expert tobacco buyers whose grades are guarded secrets.

Various circumstances, which have no direct relation to broad economic considerations, influence the prices that buyers pay to growers for their tobacco. One of these is the cost of rehandling to achieve uniformity of grade. In the case of both manufacturer and dealer the tobacco received from the farmer is reassorted for quality, color, length, etc. The cost of this rehandling varies according to the expertness of the grower in assorting his crop.

Uncertainty as to Uniformity

Another thing that works against the farmer is the buyer's uncertainty as to the uniformity of the quality of the tobacco. The tobacco is arranged in piles on the auction floor (fig. 190), and these piles are sold at a rate varying from 150 to more than 300 per hour. As a rule farmers strive for uniformity, but because they often do not know grade distinctions there may be a mixture as to quality, color, and length. In some cases the piles show the human tendency to place the best tobacco on top to catch the eye of the buyer. Occasionally the interior and base of the pile are composed of low-grade tobacco entirely concealed by better grades of leaf. This practice is known as nesting. The fear of nested tobacco frequently operates to depress prices.

A third circumstance enters into the price—the light conditions in auction warehouses. These warehouses are very large and are lighted by skylights placed at intervals over their low, nearly flat roofs. Since color is an important factor in judging the quality of tobacco, the light that falls upon individual piles exerts a strong influence upon the prices bid.

These, then, are three important factors: (1) Expense of rehandling poorly sorted tobacco, (2) uncertainty as to the proportion in which different grades are present in a mixed pile, and (3) varying light conditions.

The influence of the third factor is rather uncertain. It may cause one pile to sell higher than a near-by pile of better tobacco, or lower than an adjacent pile of poorer tobacco; it may cause tobacco to sell higher or lower than its real value. The net effect of all three factors



FIGURE 190.—Scene in an auction warehouse, showing tobacco arranged in piles ready for sale. Each pile bears a ticket similar in form to that shown in Figure 191. Approximately five seconds suffices for the sale of a single pile

is to broaden unduly the range of prices, to introduce a lack of stability in prices paid for tobacco comparable in quality, and to create strong dissatisfaction among growers. This dissatisfaction is difficult to deal with, especially in the absence of any universal language for, or authoritative determination of, quality by which the warehouseman can reply to farmers' complaints.

Grading Service Meets the Situation

The grading service, operated jointly by Federal and State agencies, fits into this whole situation with noteworthy results. By it a language of quality is supplied and a measuring rod for the determination of quality is provided—disinterested, unbiased, and sponsored by the Government.

Among its effects it (1) reduces the rehandling costs to dealers and manufacturers, (2) reduces the mixing of grades and therefore the

buyers' uncertainty arising therefrom, and (3) reduces inequalities of price arising from varying conditions of light.

The services of the federally licensed tobacco graders are available to farmers at a nominal fee at those markets where the service has been inaugurated. The grader goes upon the floor as soon as light conditions are suitable, carefully examines the tobacco, and indicates on the sales ticket the official standard grade. (Fig. 191.) In making his examination of the tobacco, he takes samples from various portions of the pile, and much more time is given to the inspection than is available to buyers under the pressure of rapid sales. Also, as far as possible, all tobacco is examined under similar light conditions.

When the sale of a pile of graded tobacco is opened, the official grade is announced. The first use made of this information is by the warehouseman or his starter, who customarily makes the opening bid on each pile of tobacco. A reference to the grade and to the average price at which the grade has been selling, posted in the warehouse, gives him an excellent basis.

The buyers find the official grade mark of immediate value in checking their judgment of quality. The benefits are shown in various ways. Buyers may or may not find that their first judgment is in error; the fear of nested tobacco disappears; they can be more certain of the average grade of the pile and can bid with greater assurance.

Grading Reduces Rejections

Next is the grower. His tobacco has been sold; the question arises whether the price is acceptable. As soon as the auctioneer knocks

down a pile to the highest bidder, the name of the buyer and the price per pound are entered on the ticket. The grower consults this ticket and the record of previous sales posted on the wall to see whether his tobacco brought a price reasonably well in line with the average price for that grade. If it did, he is usually satisfied that he has received a reasonable price. If his price is materially less than the average for his grade of tobacco, then the grower has an effective basis for rejecting the sale and demanding a new one. Partly because of the greater stability of prices for graded tobacco, and partly because of the more intelligent basis provided for analyzing results of sales, it has been demonstrated that the number of rejections is greatly reduced, and that unwise rejections are practically eliminated.

No phase of the tobacco-grading service is more important than its educational value in teaching the growers how best to handle their product so as to command better prices. Graders find themselves

| | |
|--------------------------|--|
| BIG BRICK | TYPE 13 |
| | U. S. GRADE <u>C5L</u> |
| No. <u>18360</u> | U. S. Dept. of Agriculture and S. C. Extension Div. of Markets By <u>J. C. D.</u> |
| Planter <u>A. Farmer</u> | |
| Price, \$ <u>25.00</u> | <u>148</u> Lbs. |
| Buyer <u>RJR</u> | <u>X2</u> |

FIGURE 191.—A sales ticket such as is affixed to a pile of tobacco on the auction warehouse floor. The entries, which are purely fictitious, indicate that the tobacco was delivered by A. Farmer, was graded C5L and sold to R. J. R. at \$25 per hundredweight. The number, 18360, is used to identify that particular transaction in the warehouse records, and the X2, in the lower right-hand corner shows how a buyer might indicate his private grade

surrounded by farmers who want to know the distinctions between grades. No better opportunity could be afforded for a practical demonstration of improved methods of sorting, and the fact that the grader is entirely disinterested and is backed by the Federal Government gives him prestige, and makes his friendly suggestions authoritative and acceptable. Results soon become apparent in closer sorting and in the tendency toward greater uniformity of quality. This is the feature of the service that appeals most to the dealer and manufacturer.

The tobacco-grading service is young. It began at Lynchburg, Va., in 1927, made possible by the cooperation of the Virginia Department of Agriculture and Immigration. It had two years' trial at that place. The first appropriation by Congress for the project became available July 1, 1929, and operations have been expanded to selected markets in South Carolina, North Carolina, Virginia, Kentucky, and Tennessee. It is still a new line of work, but the indications are that expansion will come as rapidly as the technic of grading on a large scale and the selection and training of personnel can be accomplished.

CHARLES E. GAGE,
*Senior Crop and Livestock Estimator,
Bureau of Agricultural Economics.*

TOBACCO Growers Gain by Acting on a Farm Reorganization Study Dark-tobacco farmers in south-central Virginia who adjusted their farming systems in accordance with the findings of a farm organization study increased their earnings, on an average, from \$773 in 1922, to \$1,158 in 1927. This was an increase of nearly 50 per cent. The increased earnings in 1927 were made in spite of the fact that tobacco prices were about 50 per cent lower than in 1922, a year as favorable as 1927 for crop production.

In contrast to this improvement in earnings are the results on other farms where no change in the farming system has been made since 1922. On these latter farms, assuming yields and prices for tobacco and for other farm products equal to the average for the State, it was estimated that operator's earnings, due to the decline in tobacco prices, would be about \$150 in 1927 as compared with more than \$800 in 1922.

Farmers who made changes in their farming systems in accordance with the suggestions given have added livestock enterprises for income, increased their feed production somewhat, and have decreased their tobacco acreage. Under the new system there has been an increase in the yield of tobacco and an improvement in its quality. The average yield of tobacco on these farms was about 750 pounds per acre in 1922 and about 900 pounds per acre in 1927. Tobacco produced on these farms in 1922 brought about the same as the average price for the State whereas in 1927 it sold for about 40 per cent more than the average. This improvement in yield and quality resulted from the use of more lime on tobacco land, from growing more legumes, and from the manure from the additional livestock.

Further Improvement Possible

In the development of livestock enterprises for income, several years are required before maximum returns can be realized. Consequently, in 1927 on most of the farms livestock enterprises had not been devel-

oped to the point at which maximum returns were being realized. The results in 1927, on the farms that followed the suggestions either partially or completely, are considered highly favorable since all farmers reported increased earnings over 1922. On some farms earnings increased only 10 per cent, whereas on one farm a 70 per cent increase in earnings was reported.

The most profitable change made by dark-tobacco farmers is the expansion of the poultry enterprise. In this section climatic conditions are favorable for poultry, and feed crops such as corn and wheat can be grown to advantage. Important eastern and southern markets are near and can be reached with express shipments.



FIGURE 192.—This 4-room tenant house was no longer needed for that purpose. It was converted into a brooder house at little expense and is large enough to brood about 1,200 baby chicks

Hog production has been increased with good results on some farms. On farms on which adequate grazing facilities are available, and sufficient feed can be raised for wintering cows, dairying has been found profitable.

In developing livestock production it was usually necessary to adopt methods that would require little additional cash outlay, as most farmers had practically no money for the new enterprise. As a result, they got their start with poultry, either by buying baby chicks or by buying eggs for hatching. Usually there were unused farm buildings that could be remodeled at little cash expense and made suitable for housing poultry. (Fig. 192.)

The project that gave the results on which these suggested changes were based represents an attempt to measure the value of findings of farm management studies for increasing farm profits and is conducted jointly by the Virginia Extension Service and the division of farm management of the Bureau of Agricultural Economics.

Considerable Variation in Earnings

Results from early studies showed a considerable variation in earnings of the different farms surveyed. A detailed analysis of the indi-

vidual farms was made to determine the possibility of making changes which would increase farming profits, and then specific recommendations were made to each of a number of farmers. Consideration was given to the ability of the farmers to carry out the plan suggested, to the adaptability of the farm to the changes recommended, and to the economic outlook of the various enterprises. Most suggestions had to do with developing livestock enterprises for income, with improving the quality of the tobacco crop through soil improvement, soil selection or better fertilization practices, with soil maintenance through crop rotation and terracing, and with the more extended use of labor-saving devices. In other words, the investigators pointed out what appeared to be practicable methods of increasing farm earnings and showed why past returns had been unfavorable.



FIGURE 193.—The use of more lime, the seeding of more legumes, and manure from the increased livestock kept under the new system have resulted in an improvement in the quality of tobacco and in increased tobacco yields

Immediately after the project was started prices for dark tobacco began declining and have continued at low levels. The decline was largely caused by changing habits on the part of tobacco users and by reduced exports. As a result of low prices for tobacco, farm earnings decreased to the point where some operators were financially unable to carry out the changes suggested. Some farmers did not follow any of the suggestions offered, others followed some of them, still others followed practically all of the suggestions.

Combining one or more livestock enterprises with tobacco farming has already proved profitable to these farmers. The results of these studies should continue to be of value especially to other farmers in the area since the demand for dark fire-cured tobacco probably will continue at relatively low levels.

A. P. BRODELL,
*Associate Agricultural Economist,
Bureau of Agricultural Economics.*

TURKEY Grading Proves to Be Popular at the Terminal Markets

Success of the turkey-grading demonstration conducted by the Bureau of Agricultural Economics for the Christmas market of 1927 led to such a demand for similar grading for the 1928 season that the bureau was unable to comply with many of the requests. Demands for the 1929 season were even greater.

With a limited number of licensed turkey graders in 1928, it was necessary for the bureau to limit the service to the terminal markets where larger supplies were available than at scattered shipping points.

Applications for the service were made by dealers in Portland, Me., in Boston, Springfield, Lynn, Hartford, Providence, New Haven, New York City, Troy, Albany, Baltimore, and Washington, D.C.

Cooperation was obtained from practically all the State marketing officials in the States where the grading was conducted, and turkey-grading schools were held by the bureau in Harrisonburg, Va., Washington, New York, and Boston.

The territory was divided into three sections, with headquarters at Boston, New York, and Washington. A supervising grader from the bureau was stationed at each of these points, and the grading was accomplished under his direction.

The largest number of turkeys was graded in Boston, where a total of 524,780 pounds was graded. In New York, 484,347 pounds were graded; Washington, 246,747; Baltimore, 150,329; Springfield, 117,430; Providence, 111,074; New Haven, 56,134; Troy and Albany, 35,136; and Portland, 9,675. The total quantity graded at all points amounted to 1,735,652 pounds.

Each bird of the required quality was stamped on the back, with the grade "U. S. Prime," and a tag was attached to a wing which carried a statement regarding the grading and designated the class of the bird, such as "young hen," "hen," "old tom."

A fee at the rate of \$2 an hour was charged for the grading work. Total fees paid by the applicants for the grading service amounted to \$1,591, of which \$118 was received by the cooperating State agencies; the balance was paid into the United States Treasury.



FIGURE 104.—In grading turkeys according to Government grades, each turkey is stamped with the grade name on its back. The tag attached to its wing denotes its class

Customers Express Satisfaction

The grading work demonstrated clearly two important facts, both of vital importance to the poultry industry. First, the buying public has confidence in Government-graded products. Ninety-six and three-tenths per cent of the 571 customers who answered a questionnaire

sent to them indicated satisfaction with this method of buying. Many expressed a wish that all classes of poultry be so graded. Second, it demonstrated indirectly the enormous economic losses to turkey producers and packers caused by improper dressing and marketing.

Of the turkeys graded, more than 200,000 pounds were of a quality below U. S. Prime. Much of the inferior quality was caused by carelessness in dressing and packing; much was caused by marketing the birds before they were properly matured; and a considerable part was caused by defects and deformities of the birds due to inferior breeding stock and improper feeding.

To comply with the demand of the country packers and to demonstrate the importance of proper grading to the producer and packer, the bureau graded turkeys in 1929 at country packing plants. Grading schools were held in the West. This work should result in saving a great deal of money to producers and packers, and in eventually placing a turkey of much better finish and higher quality on the consumers' tables.

THOMAS W. HEITZ,
*Associate Marketing Specialist,
Bureau of Agricultural Economics.*

WARTS of Cattle Are Infectious and Cause Damage to the Hides

Warts are of common occurrence in cattle, particularly in calves. Observations of hides removed in slaughtering establishments indicate that in certain sections of the country from 15 to 25 per cent of young cattle have these growths, especially during the summer. Since warts often

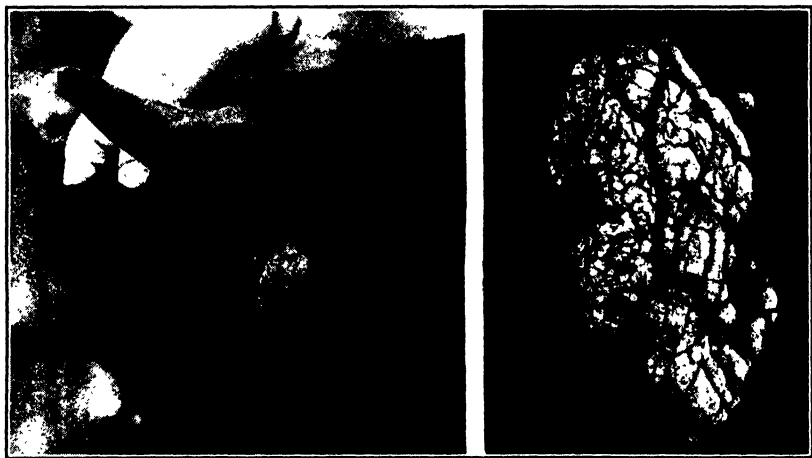


FIGURE 195.—Warts produced by the inoculation of (left) unfiltered and (right) filtered wart material into the skin of calves. Actual sizes of the warty growths were (left) about 2 by 3 inches and (right) about 2 by 4 inches

materially reduce the value of cattle hides, this subject is of considerable economic importance. The number of cattle affected appears to be increasing. Accordingly, a series of experimental studies was undertaken by the writer to learn the cause and other facts concerning common warts in cattle.

These studies consisted in bacteriological examinations of various wart specimens and also in making skin inoculations of cattle with the wart material. Altogether 22 cattle were used, 20 of which were young animals ranging from 5 to 12 months old. Inoculations were made with unfiltered and also with filtered wart material, the latter being the wart extract which had been rendered free from all known living germ life, by passing the extract through a bacteria-retaining filter.

Definite positive results (fig. 195) were obtained in 15 of the 22 cattle used in the experiments. Eight of the calves acquired warts from being inoculated with the unfiltered wart material and seven through inoculations with the wart filtrates.

The results indicate that common warts in cattle can be transmitted experimentally to animals under 1 year of age with a fair degree of regularity. Filtrates of bovine warts, though proved by tests to be free from germs, are capable of producing warty growths when inoculated into the skin of healthy cattle. The warts produced by filtrate inoculations may be transmitted also to other calves. The experiments thus indicate that the cause of common warts in cattle is probably of the nature of a filtrable virus.

GILBERT T. CREECH,

Associate Veterinarian, Bureau of Animal Industry.

WATER Follows Laws Long Ago Expressed in Familiar Sayings

The old adages "Water seeks its own level," "Water runs down hill," and "Still waters run deep" have definite application to many puzzling ques-

tions that confront a farmer in conveying water about his farm.

Have you ever been disappointed in the flow through a 2-inch pipe, while your neighbor secured an ample supply from one of identical size? Have you ever wanted to pipe water across a ravine but did not try it for fear the water could not climb up the far side? Have you wanted to place a culvert well below the surface of a road to avoid a hump in the road but feared that to lower the culvert would cause it to choke up with mud? Have you ever told anyone that your pump had such capacity that it filled a 12-inch pipe? Have you replaced a 6-inch pipe with a 12-inch pipe when you desired to double the capacity? Have you provided sufficient size and fall for your pipe line or flume, only to find that the water could not get into it fast enough at the intake end? Have you believed that your line would have greater capacity if the water "had a good get-away at the outlet," or argued that the water in an inverted siphon pipe across a depression flows faster down the first slope than it does up the far slope? Have you ever built a small ditch with the same slope as that found satisfactory for a large one and then been disappointed in the velocity and hence in the carrying capacity?

The Basic Principles

A proper understanding of the simple principles involved will enable most farmers to arrive at reasonably proper solutions of many problems in water conveyance, such as those suggested in the foregoing paragraph. The elemental law relating to flow in a pipe line can be expressed as follows:

Water seeks its own level. It will rise as high at the outlet end of the pipe as the water surface at the inlet, but it will not flow after it has reached this condition. The adage uses the word "seeks," indicating that the latter part of the adjustment is quite slow. For usual conditions, all of the pipe line must be lower in elevation than the water surface at the inlet.

Water runs down hill. When water is confined in a pipe, the hill is the imaginary line joining the water surface above the inlet with the water surface above the outlet, or to the outlet end of the pipe when the latter is not submerged. The pipe may be laid up hill and down, provided only that it be kept below the elevation of the water at the inlet, but satisfactory operation will be most certain if it stays below a straight line joining inlet and outlet.

The steeper the hill, the faster the water runs. The height of the imaginary hill in proportion to the length of the pipe is an index of the velocity of water in the line. A fall of 1 foot for each 100 feet of pipe line (measured along the pipe itself) is described as $S=0.01$ or, in words, the slope is 1 in 100.

Still waters run deep. The quantity of water, Q , flowing in a pipe, expressed as cubic-feet per second, is equal to the area of the pipe opening, in square feet, times the velocity of the water, in feet per second, that is, $Q=AV$. If you wish the answer in gallons, then $Q=7.48 AV$ gallons per second. In one minute there will flow sixty times as much as in one second. Since the same equation holds true for open channels, we can understand why a small stream ripples rapidly through narrow shallow reaches between quiet deeper pools. Since the same quantity of water is flowing through all cross sections, if the area of the section across a deep pool is one hundred times as great as that across the riffles, then the water must flow one hundred times as fast through the riffles as in the pool, and the slower flow is quieter.

Answers to the Stated Problems

By the use of the simple principles given above, the problems stated at the beginning of this article can now be answered.

Your neighbor secured a good flow through his 2-inch pipe and you did not, probably for the reason that he had a steeper slope, that is, more fall in proportion to length of pipe. If your pipe is twice as long as your neighbor's, you will require about twice as much drop in elevation between water surface at intake and water surface at outlet. Thus the fact that a certain size pipe will give a certain yield in one situation is no indication that it will do so in another.

You can cross a ravine with a pipe line, allowing the pipe to follow down the near slope and up the far slope without difficulty, but you must have the outlet of the pipe lower than the inlet. If it is but a little lower, the flow will be but a dribble; to double the flow you will have to increase the fall from inlet to outlet about four times.

You can take the bump out of a road by placing the culvert pipe well below the surface of the road. If the cross-sectional area of the pipe is less than the area of the cross section of the water in the ditch, then the water will speed up to get through the culvert and thus prevent the deposit of silt. The writer has seen many cases where muddy waters filled the open ditches but the road culverts were always clean. However, to provide the fall in the water surface from inlet to outlet of the

culvert, it will be necessary to raise the banks of the ditch upstream from the culvert so that the water will check up a little higher than it did for the old culvert.

When you told someone that your pump could fill a 12-inch pipe, did it occur to you that a pump throwing but half as much water would also fill the same pipe but that the water would be flowing only half as fast? Likewise a pump throwing four times as much water would fill the pipe but the velocity of the water would be four times as great and the friction head at the pump would be nearly sixteen times as great.

When you replaced a 6-inch pipe with a 12-inch pipe to double the flow, you actually increased the capacity about six times. As a matter of fact, an 8-inch pipe will convey about twice the amount of water that a 6-inch pipe of the same length and same fall will carry.

When enough water did not enter the intake of your pipe, even though the fall and the size of pipe were sufficient to carry all the water desired, there was but one thing lacking—the intake was too high. If your pipe was to carry the water at a speed of 8 feet per second, the intake end should be at least $1\frac{1}{2}$ feet below the surface of the water. Of this, 1 foot depth is needed to generate the velocity of the 8 feet per second. The additional one-half foot is necessary to overcome retarding influences around the usual entrance to a pipe line. Much water trouble has been caused because someone forgot or did not know that velocity head must be provided.

Effect of a Submerged Outlet

In regard to the get-away at the outlet of a pipe, the effect of a submerged outlet depends upon the depth of submergence in proportion to the difference in elevation of water surface between inlet and outlet of the pipe. A good get-away does aid the discharge for a short pipe, but for a long pipe, or wherever the depth of water over the outlet is not great compared with the total fall from inlet to outlet, the discharge is not materially reduced for lack of a good get-away.

Where an inverted siphon pipe is the same size throughout its length, the velocity within the pipe is the same at all places where the pipe is full of water.

Water will not flow as fast in a small channel as in a larger one of identical construction and shape, having the same slope or rate of fall. Water in a large canal may flow very satisfactorily on a slope of 1 foot per mile of canal, while to get the same velocity in a small head ditch might require a fall of 1 foot per 1,000 feet of ditch, and in a small field lateral a fall of 2 or 3 feet per 1,000 feet of lateral.

In the scope of this article it is not possible to detail all the possible water problems that may confront a farmer. Some of the more common errors made by farmers who perforce must do much of their own planning and construction have been pointed out. The principles stated above will give a clearer understanding of most water problems, but the solution of the questions in terms of definite quantities of water is a complex matter, and a farmer or organized group of farmers will find that a small amount of money invested in proper engineering advice will pay large dividends in results.

F. C. SCOBEY,

Senior Irrigation Engineer, Bureau of Public Roads.

WEATHER BUREAU Much statistical material on the occurrence of tornadoes has been collected by the Weather Bureau and other Government agencies at

Gets Data on Behavior and Effects of Tornadoes various times during the last 50 or more years. Lack of reporting stations in certain districts where these storms are known to occur, and an early general lack of population over some of the lately developed territories in the tornado area, made it impossible to secure the full facts from certain regions until within comparatively recent years.

The tornado is a local whirlwind of great velocity, generally accompanied by rain, thunder, and lightning. Its almost invariable characteristic is a funnel-shaped cloud that appears to hang from the bottom of a much greater cloud mass above. The wall of the funnel, of 50 to a few hundred feet in diameter, consists of a mass of violently whirling air with strong ascending components. The whole system progresses, in general, from southwest to northeast in a narrow path (a few feet to a quarter mile in width) at a speed of 30 to 40 miles per hour. The length of the path varies from a few miles up to 200 miles or more.

Behavior of Tornadoes

Tornadoes usually occur in the southeast quadrant of an advancing low-pressure area and seem to be formed at the cloud level by the passing of a cold northerly current by a warm current from some southerly direction. At the junction between these winds a whirl may be set up which, descending toward the earth, reaches the ground as a violently rotating wind column of varying dimensions that moves generally in a northeasterly direction, and that frequently causes loss of life and property damage, the extent depending largely on the character of the territory over which it passes.

The most extensive tabulation of tornado statistics appears in a professional paper of the signal service, No. VII, entitled "Character of Six Hundred Tornadoes," by Finley, published in 1884, and containing such information as was obtainable for the period 1794 to 1881.

While the period covered by this investigation was a long one—nearly 100 years—still the facts presented did not represent anything more than general statements of the occurrences of these storms. They afforded no means for correctly interpreting the comparative frequency of tornadoes over different parts of the country, or in the different parts of a State.

The next attempt to gather such statistics on a country-wide basis was made in the Weather Bureau by Henry who gathered and published the details of tornadoes occurring in the period 1889 to 1897, but these data were not representative of all parts of the country, due to the conditions referred to previously, which still existed to some extent even in that period.

In 1916 the Weather Bureau again undertook to collect tornado statistics on a uniform basis for all parts of the country. By that time the areas where these storms are most frequent had become more fully populated and the means of securing details of their occurrences had become widespread. It was felt no important tornado could occur without being reported from some portion of its path.

Beginning with 1916, statistics on all tornadoes that have been reported from any part of the country have appeared in the annual

reports of the Weather Bureau. In addition to narrative accounts of the storms, giving the dates of their occurrence, the direction of their movement, the length and width of their paths, and data on life and property loss, the locations of the storms have been indicated on charts. A separate chart has been presented for each year since that time.

A preliminary discussion of these storms by the methods heretofore followed was made in 1924 by Hunter, but as the method of grouping statistics was still by States, this survey offered no easy method of studying their comparative frequency over the different parts of the country or in different parts of the States affected.

Method of Reckoning by Areas

In this article the facts are graphically presented by dividing the entire country into equal areas of 10,000 square miles each, regardless

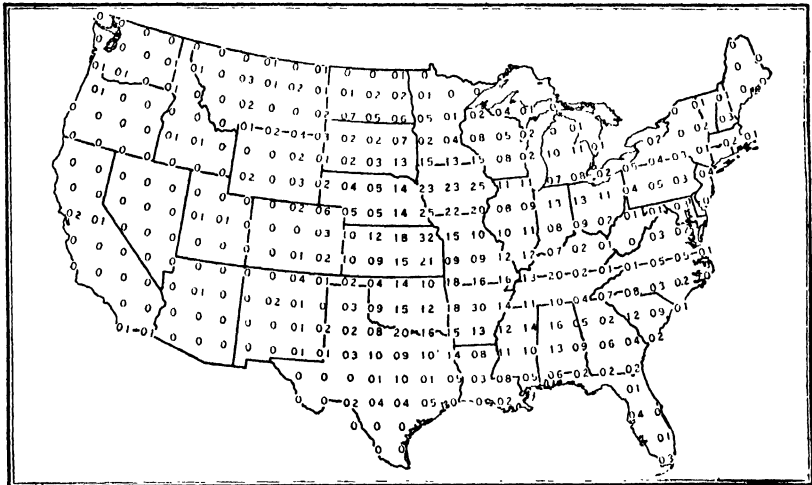


FIGURE 196.—Tornado occurrences in the United States, 1916 to 1928, inclusive. In this chart the country is divided into equal areas of 10,000 square miles each, regardless of State boundaries

of State boundaries, each area being 100 miles square. Within these squares is placed the number per year of tornadoes that occurred within the 13 years of this record. Any tornado having a track within the limits of a certain square was counted as one for that square. Where the track extended into a second square it was likewise counted as one occurring within that square. A long track occasionally passing over two or more squares was counted in each square over which it passed. By combining the counts for each of the 13 years for the same square, the averages for the entire period were found and these were placed in their respective squares in Figure 196.

A study of the chart (fig. 196) shows an area of maximum occurrence of tornadoes over extreme northeastern Kansas, where the average number of these storms for the period was slightly more than three per year. Numbers nearly as high are found in near-by portions of Nebraska, in central Arkansas, and generally over the greater part of Iowa.

Over the less elevated portions of the country between the Rocky and Appalachian Mountains tornadoes are distributed fairly equally. The frequency diminishes westward quite rapidly as the Plains merge into the Rocky Mountains. Tornadoes are much less frequent west than east of those mountains. To the northward over the Great Plains they diminish in frequency and become somewhat rare near the Canadian boundary. In the East they are mainly much less frequent than in similar latitudes of the Mississippi Valley. They are less frequent in the more elevated portions of the Appalachian Mountain region than farther eastward toward the coast. Certain areas in West Virginia were exempt from a visitation during the period under discussion. None occurred in Maine. They diminished toward the Gulf coast, though the evidence indicates that they may occur in all parts of Florida. Tornadoes have not been observed in extreme southern Texas.

The chart indicates the comparative frequency of tornadoes in the different areas of the United States, and the improbability of any important area east of the Rocky Mountains being entirely free from such visitations. However, when the narrowness of their paths is considered (frequently only a few yards or rods) and the fact that their length is often but a few miles, it is evident that the chance of a tornado occurring at any particular point, even in the region frequently struck by tornadoes, within a limited period of time is small.

The chief concern is the fact that tornadoes will occur in the future. Moreover, their destructive effects will continually be augmented, not by increased severity of the storms, but as a result of the growing population and the building of larger factories, schools, or other places where people congregate.

TABLE 20.—Total number of tornadoes in the United States, by months and years, 1916 to 1928, inclusive

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Annual |
|---------|------|------|------|------|------|------|------|------|-------|------|------|------|--------|
| 1916 | 3 | 0 | 1 | 7 | 15 | 38 | 4 | 4 | 2 | 1 | 0 | 11 | 86 |
| 1917 | 4 | 0 | 14 | 6 | 50 | 39 | 3 | 1 | 0 | 4 | 0 | 0 | 121 |
| 1918 | 3 | 3 | 0 | 18 | 34 | 8 | 1 | 6 | 4 | 1 | 3 | 0 | 81 |
| 1919 | 0 | 0 | 15 | 15 | 13 | 3 | 3 | 6 | 4 | 5 | 0 | 1 | 65 |
| 1920 | 0 | 2 | 22 | 15 | 13 | 14 | 12 | 2 | 5 | 1 | 0 | 1 | 87 |
| 1921 | 0 | 4 | 14 | 39 | 17 | 6 | 4 | 4 | 9 | 1 | 3 | 5 | 106 |
| 1922 | 3 | 2 | 26 | 23 | 16 | 9 | 8 | 7 | 4 | 0 | 9 | 1 | 108 |
| 1923 | 2 | 0 | 8 | 16 | 27 | 19 | 5 | 10 | 11 | 0 | 2 | 0 | 100 |
| 1924 | 1 | 4 | 13 | 28 | 18 | 24 | 14 | 9 | 10 | 1 | 3 | 5 | 130 |
| 1925 | 4 | 6 | 10 | 19 | 5 | 38 | 12 | 4 | 4 | 8 | 4 | 5 | 119 |
| 1926 | 2 | 4 | 4 | 13 | 13 | 17 | 14 | 11 | 9 | 1 | 23 | 0 | 111 |
| 1927 | 0 | 6 | 9 | 41 | 54 | 10 | 13 | 3 | 14 | 9 | 4 | 1 | 164 |
| 1928 | 5 | 0 | 7 | 24 | 21 | 71 | 25 | 23 | 13 | 5 | 5 | 4 | 203 |
| Total | 27 | 31 | 143 | 264 | 296 | 296 | 118 | 90 | 89 | 37 | 56 | 34 | 1,481 |
| Average | 2.1 | 2.4 | 11.0 | 20.3 | 22.8 | 22.8 | 9.1 | 6.9 | 6.8 | 2.9 | 4.3 | 2.6 | 113.9 |

The occurrence of tornadoes during the different seasons is shown in Table 20. This table indicates a great excess of occurrences during the late spring and early summer months over those in other months.

May and June have the maximum occurrences, and January the least. There is little difference in the frequency of tornadoes during the winter and late autumn. The year having the greatest number of separate occurrences, 203, was 1928; the least, 1919, with 65.

Losses of Life and Property by Tornadoes

Table 21 shows some statistics of the loss of life and the estimated monetary damage to property caused by tornadoes during the period covered. The largest loss of life and property usually occurred when a storm passed over a city or a number of thickly inhabited areas. In 1924, on June 28, great damage occurred in and near Lorain, Ohio, with a loss of nearly 100 lives and property damage amounting to about \$12,000,000. In 1925, on March 18, a tornado of unusual length and severity passed from southeastern Missouri across Illinois into Indiana, a distance of more than 200 miles, and caused the death of 689 persons besides property damage amounting to more than \$16,000,000. In 1927, on September 29, at and near St. Louis, Mo., 79 lives were lost and property damage estimated at \$25,000,000 resulted from a tornado.

TABLE 21.—*Statistics of tornadoes in the United States, by years, 1916 to 1928, inclusive*

| Year | Number reported | Aggregate loss of life | Most deaths in a single tornado | Aggregate reported property losses | Number of tornadoes causing losses of— | |
|-----------|-----------------|------------------------|---------------------------------|------------------------------------|--|-------------|
| | | | | | \$100,000 | \$1,000,000 |
| 1916..... | 86 | 140 | 30 | \$2,511,500 | 6 | 1 |
| 1917..... | 121 | 508 | 103 | 15,007,700 | 22 | 5 |
| 1918..... | 81 | 134 | 36 | 7,631,200 | 20 | 1 |
| 1919..... | 65 | 205 | 59 | 6,861,500 | 9 | 2 |
| 1920..... | 87 | 498 | 87 | 15,205,000 | 24 | 7 |
| 1921..... | 106 | 202 | 61 | 5,406,300 | 13 | 1 |
| 1922..... | 108 | 133 | 16 | 6,630,000 | 21 | 0 |
| 1923..... | 100 | 109 | 23 | 2,958,750 | 9 | 0 |
| 1924..... | 130 | 376 | 85 | 26,120,850 | 27 | 4 |
| 1925..... | 119 | 794 | 689 | 24,023,900 | 27 | 1 |
| 1926..... | 111 | 144 | 23 | 4,318,950 | 17 | 0 |
| 1927..... | 164 | 540 | 92 | 43,445,650 | 31 | 7 |
| 1928..... | 203 | 92 | 14 | 13,235,600 | 28 | 4 |

Physical Effects of Tornadoes

Instances are recorded where heavy iron beams offering little surface resistance to tornadoes, as compared with the weight to be moved, have been picked up bodily and moved considerable distances. In one case two iron frame cultivators standing side by side in a field were picked up and carried some distance and dropped in different places. One was torn apart and the portions bent, while the other was deposited intact.

On the other hand, marvelous examples are on record where frail objects were moved lightly. A nest with an egg in it was carried away with the wreckage of a barn, but deposited so lightly that the egg was not disturbed. In another case a child was carried some distance by the wind and dropped uninjured, while near by a horse was mangled and killed. A man alone in his home at night did not notice the fact that his house had been lifted from its foundation, and was moving in the air, until his attention was called to the opening of a door. He stepped outside, and fell a considerable distance.

Safety Methods to Be Observed

As tornadoes usually move from west to east, one's first thought, in case of a threatened tornado, should be to move as rapidly as possible

at right angles to the direction in which the storm appears to be moving. Frequently the approach of such a storm may be observed at some distance. A position on the north side of the storm's track is safer than one at an equal distance to the south.

If no means of quick escape offers, safety should be sought in a tornado cellar. Many sections of the country are provided with these safeguards. In their absence the cellar or the basement of a frame house offers the next best chance. It is best to choose the side which the storm is approaching, especially the southwest corner, close to the wall, where, if the house moves or breaks apart, the débris will ordinarily be carried away from this position.

In a brick house, however, the walls may collapse and the cellar prove a death trap instead of a refuge. If there is no protection below the ground level, it is well to pick some depressed location and lie flat, face down, holding onto anything handy.

In schools of one story, the pupils' desks, if strongly fastened to the floor, offer instantly available refuges, under which the pupils may crouch and be shielded, with risk of death or injury greatly lessened, when no better protection is available.

A careful inspection of the storm path of one of the most destructive tornadoes of recent years that passed for more than 200 miles in a nearly straight line from near Annapolis, Mo., across the entire State of Illinois and into Indiana, disappearing about 3 miles southwest of Petersburg, Pike County, Ind., on March 18, 1925, disclosed that steel and reinforced concrete buildings withstood the force of these winds without much damage. It was not possible, however, to state in all cases that these were exposed to the full force of the wind. It appeared also that frame structures strongly braced with sheathing, as if prepared for the placing of a stucco finish, offered much resistance to the winds. All brick structures, as well as ordinary frame buildings in the direct path of the storm, suffered greatly, the brick buildings particularly in their upper portions, though many of the lower walls remained standing. In general, the only structures that escaped material injury were as stated above.

It seems possible to build structures that will stand the force of these winds, but whether the chance of a certain area being struck by a tornado is sufficiently great to justify the increased cost of erection is for the individual to decide. However, it is thought that schools and other public buildings and factories or like structures where large numbers of persons are gathered, should be constructed with a view to being able to withstand the force of the tornado.

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Climatologist, Weather Bureau.

WEATHER'S Influence on Plant Diseases Important and Frequently Dominant

The weather has been defined as the daily and hourly condition of temperature, humidity, rainfall, and other factors, the sum total

of which for a period of years makes up the climate. These changes have a very great effect on plant diseases, often a dominant effect. The most striking and definite effects, of course, are produced by the extreme or unusual conditions.

Plant diseases may be classified as parasitic, virus, and nonparasitic. The parasitic diseases are the direct result of the attacks of parasites, mainly fungi, bacteria, and nematodes. (The direct effects of insect attacks on plants are not ordinarily classed as diseases in the United States.) The virus diseases belong to a special class and might be considered as a group under the parasitic. They are infectious, have definite geographical distribution, and act in many ways like parasitic diseases, but no causal organisms have ever been isolated from them. The nonparasitic diseases form a large and varied group, comprising all types not caused by parasites or by infectious virus. These are due in a general way to environmental conditions and to some extent to disturbances within the plant itself.

Weather conditions, especially the extremes, have a profound effect on all three of these classes of disease, and in the nonparasitic class may be the main or the sole cause.

In each weather factor influencing plants, such, for example, as temperature, sunlight, and precipitation, there is a best condition, an optimum or ideal in which the plant thrives best; also a minimum and a maximum at each of which it is killed and near which it suffers injury. In the zones approaching the maximum and the minimum many types of plant diseases are produced or influenced by the weather. The only other large group of factors of the physical environment of plants which produce disease are those connected with the soil, and the soil itself is profoundly affected by weather conditions. Plants suffer from unfavorable weather in varying degrees. It is only the results of extremes which produce some marked injury or symptom from which they do not recover or recover imperfectly or slowly, that should be classed as disease.

The various weather factors may be outlined as follows: Temperature, precipitation (dew, rain, hail, snow, sleet), relative humidity, sunshine, wind velocity, barometric pressure, and electrical conditions. All these, except possibly the last two, very definitely influence plant diseases.

Sun Scald of Various Types

Among temperature and sunshine injuries or diseases there is sun scald of various types, including winter sun scald of the trunks of trees caused by the nearly horizontal rays of the 3 o'clock sun; summer sun scald, produced by the nearly vertical rays of the noonday sun on the bark of horizontal branches; tip burn and margin scald of leaves; and heat scalding at the ground line of seedling trees and other plants, including seedling pecans. Many plants are sickened by high temperatures. Blossoms may be injured or prevented from setting fruit, without definite lesions or wounds. That winter injury limits the northern range of fruit trees and perennial plants in the North Temperate Zone is generally known. It is less commonly known that high winter temperatures limit the southern range of deciduous fruit trees and many perennial plants. The absence of the winter resting period results in serious physiological disturbances, failure to grow, failure to fruit, or even premature decline and death.

Even less critical temperatures have a profound effect on the parasites and their ability to attack the host plant. High summer temperatures not particularly injurious to the host may have a very definite limiting effect on disease-producing fungi and bacteria. This

limits some of the diseases to the cooler sections of the United States, or to cooler seasons of the year. The reverse conditions obtain with certain fungi, such as apple bitter rot and blotch, which occur well to the southward and thrive only during hot summer weather.

Generally speaking, the fungous diseases are most serious in rainy or moist regions and during periods of excess of moisture, and the physiological or nutritional diseases are more abundant in dry climates or in abnormally dry seasons, but in both cases there are some very definite exceptions. Powdery mildews and rusts are apt to occur abundantly in semiarid regions. Fungous diseases of the roots of plants apparently are just as common in the drier parts of the country, but the average soil moisture, since it is supplied largely by irrigation, is probably about the same as in rainy sections. In districts where the rainfall regularly exceeds the evaporation and water passes downward through the soil, washing out excesses of salts or injurious sub-

stances, deficiency diseases are more common. In the drier regions in the western half of the United States, where the rainfall does not equal the evaporation and where soluble materials may accumulate in the soil in dangerous concentration, nutritional diseases due to excess of substances are most abundant.



FIGURE 197.—Apple twigs affected by the apple powdery mildew fungus. Yellow Newtown from California. Photographed in September

Infection Periods in Fungous Diseases

Rain, fogs, and heavy dews constitute important factors in both non-parasitic and parasitic diseases, especially the

latter. Most parasitic fungi require definite infection periods, that is, rain with a spell of cloudy weather and high humidity, for their successful attack on the host plant. The apple powdery mildew can germinate on the heavy dew and accompanying fog. (Fig. 197.)

Relative humidity, while often associated with precipitation, is really a different factor. There may be long periods of high relative humidity with light rainfall, or heavy rainfall during short periods with prolonged intervals of low humidity. Plants are keenly sensitive to relative humidity, and so are most of their fungous enemies. As a rule, high humidity is injurious to most crop plants, or perhaps, more accurately, plants suffer from periods of dry, hot sunshine much more seriously when they have been grown in or subjected to long periods of moist, cloudy weather. Yet, in a general way, sunshine counteracts the effects of too much rain and humidity. There is, however, a correct amount, or optimum, of sunlight for each plant, if other factors are normal, and this produces dark-green, vigorous foliage and the

best possible growth. Too much sunlight produces pale-green leaves, small in area, resulting in a disease named "insolation."

Mechanical injuries resulting from snow, hail, and sleet are well known. Certain types of injuries are produced by the smothering with snow and ice. Broad-leaved evergreens may be winter-injured at noncritical temperatures when covered with frozen rain or sleet, and certain fungi attack their host only under snow.

After Effects of Mechanical Injuries

The effect of wind in uprooting trees and plants, breaking branches, splitting forks, and blowing off the fruit is well known. Fungous diseases oftentimes follow mechanical injuries to trunks and branches of trees. Wind accompanied by freezing weather greatly increases the intensity of injury to fruit trees in blossom or young fruit. Furthermore, wind currents are very largely instrumental in distributing spores of fungi. Extremely dry winds on the Pacific slope have resulted in the drying up of the pistils of fruit blossoms, thus preventing the setting of the fruit.

Plants are not especially sensitive to barometric pressure. Experiments have given negative results. Fungous activity during a low barometric period may be laid to the moisture rather than to the actual barometric condition.

Direct injuries and mutilation to trees and even other plants by lightning strokes are well known. Sometimes in vineyards the current runs along the wires to which the vines are attached and kills a large number of the vines.

Parasitic Diseases

In the case of parasitic diseases the weather affects both the host and the parasite. The weather that counts most is that at some critical period, when the plant is starting into growth in the spring, when the leaves or fruits are young and tender, when seedlings are germinating, or when trees or plants are in blossom, and again when fruits and leaves are declining in vigor on approaching maturity. But especially the weather at some particular period in the life history of the fungous parasite may determine the amount of disease for that season.

In general, parasitic fungi reach the leaves, fruits, or stems of plants in the form of spores blown by the wind or carried by insects. These spores have to germinate in a drop of water (rain or dew), and this moisture must be maintained usually for several hours. A rain-storm or perhaps a very gentle misty rain with high relative humidity at this critical time becomes an infection period. With many fungous diseases these infection periods require for their greatest effects that the moisture shall remain on the leaves for an entire 24-hour day, and often this is stretched to 48 hours or more. Heavy, dashing rains are not considered ideal infection periods, whereas light rains with high humidity maintained for a long period appear to furnish the most complete infection periods. Some fungi, like the downy mildew of grape or potato, germinate in a drop of water, and the germ tube must find a stomate to enter; in other cases they bore directly through the cuticle. The spores of some fungi germinate in half an hour.

The cuticle is air-tight and water-tight, and when well developed, one of the most resistant of all plant tissues. The plant is therefore

sealed up against all but its most active parasites. If conditions are sufficiently unfavorable, some of these can penetrate the uninjured cuticle; but storms whip the leaves and branches and break the cuticle, and feeding punctures and egg-depositing injuries are made by many kinds of insects.

Examples of Weather Effects

A few examples may be given of the effect of the weather factors on certain diseases.

Apple scab: The apple-scab fungus thrives best in cool, moist weather. It most readily attacks the tender young leaves and young growing fruits. It is most severe in the northern apple sections, extending southward in the Allegheny Mountains. It has a summer-spore form and an overwintering or mature form. The latter lives on the fallen leaves and requires a resting period of cold weather. In the mild temperatures of midspring it requires rains for actually

throwing out its wind-borne spores. Dry springs are distinctly unfavorable both to the infection by the overwinter form and to the distribution and secondary infection by the spring and summer form.

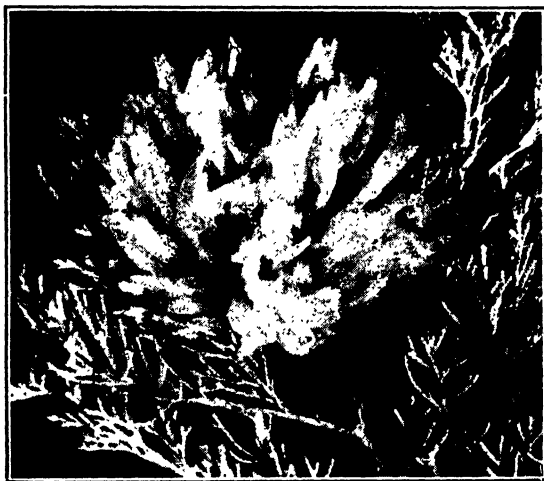


FIGURE 198.—A gall of the common cedar rust with its gelatinous spore masses fully exuded, on the red cedar, ready to transfer to the apple in late April

Apple cedar rust: The cedar-rust fungus, with its complicated life history and dual hosts, is extremely susceptible to rain at certain critical periods. The galls that carry the fungus on the red cedar mature about the time that apples come into

blossom. When rain comes they swell out their gelatinous spore masses (fig. 198) and exude millions of tiny secondary spores called sporidia. These are wind borne and must in turn have moisture in which to germinate after they reach the apple leaves. (Fig. 199.) As long as it stays dry, this fungus simply waits. In the spring of 1926 at Washington, D. C., no spores were thrown out from the red cedars until May 15, after fully half the infection season had passed. Few rains occurred between that date and June 10, when the period of spore exuding ends. As a result, only a moderate amount of cedar rust occurred in this vicinity. In 1929 there were frequent rains throughout May and June, and a much larger amount of apple cedar rust. A July and August drought may affect the transfer of the fungus from the apple to the cedar, and on account of the 2-year life cycle, may result in less apple cedar rust the second season.

Brown rot of stone fruits: Brown rot of peaches and other stone fruits is extremely sensitive to moisture, but only moderately so to

temperature. Moisture conditions when peaches, plums, and cherries are in bloom in the spring often result in severe blossom infection. Then again, as the fruits approach maturity they become susceptible to the rot, and the results are often very destructive in the humid eastern United States, especially on plums, peaches, and sweet cherries. In the States of Oregon and Washington, which have winter rains, infection periods for this fungus with sufficient moisture occur mainly in the spring and in the fall.

Pear blight: This is a bacterial disease which is greatly favored by moisture conditions during critical infection periods. For its most active infection there should not be too much rain during the blossoming period, since this interferes with the insect visitors which carry the germs from flower to flower and from tree to tree. It is not killed by cold in the bark of apple trees in the Dakotas but remains dormant during cold weather. In general, however, it is less serious in the northern limit of apple and pear culture and more serious in the Gulf Coast States and in California. The dry, sunny summer weather of California tends to check pear blight and to prevent new infections, but the mild winter weather of that State, with its frequent rains, is extremely favorable to the development of the holdover blight, as well as blossom, twig, and bark infections in early spring.

Peach leaf curl and the gumming fungus: These fungi (fig. 200) like cool weather and moisture. In both cases the spores fall on the buds and twigs in the summer and autumn, and the fungus grows in winter or early spring. Rains favor and dry weather checks their growth.

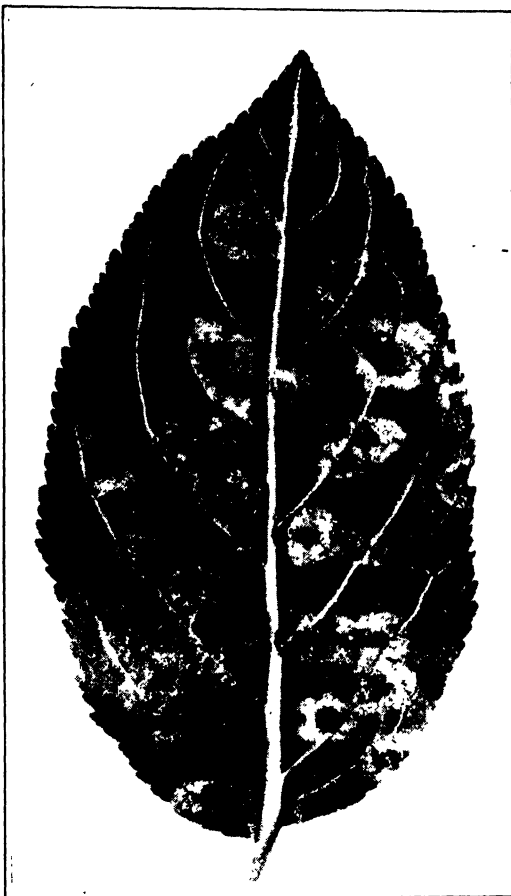


FIGURE 199.—Cedar rust, showing cluster cups, under side of leaf of Maiden Blush apple. From Maryland

Virus Diseases

Among the virus diseases less definite statements can be made about weather influences, with present incomplete knowledge. In

the peach-yellows group the weather appears to have practically no effect on the disease after it once shows in the tree.



FIGURE 200.—Peach leaves attacked by the peach leaf curl fungus. Photographed in May

The trees die according to their regular program within four or five years. Some influence, however, causes enormous variation in the number of new cases that appear in different seasons and in different communities. In some virus diseases the weather conditions affecting the insect vectors are known to have a profound effect on the amount of the disease. In some cases virus diseases of a milder nature are known to be entirely masked temporarily by favorable weather conditions

which cause the plant to grow so vigorously that it appears normal.

Physiological or Environmental Diseases

In the group of physiological or environmental diseases the extremes of weather conditions may be the direct cause, or, operating

with other factors, may be an important part of the cause. Winter injuries (fig. 201) and frost injuries (figs. 202 and 203), scald, and heat injuries have already been mentioned. Winter injuries are by no means always due simply to intense cold, but more commonly to preceding warm spells which have prevented ripening or stimulated the tree into growth and changes of the sap which have made it abnormally susceptible. Frost collar injury

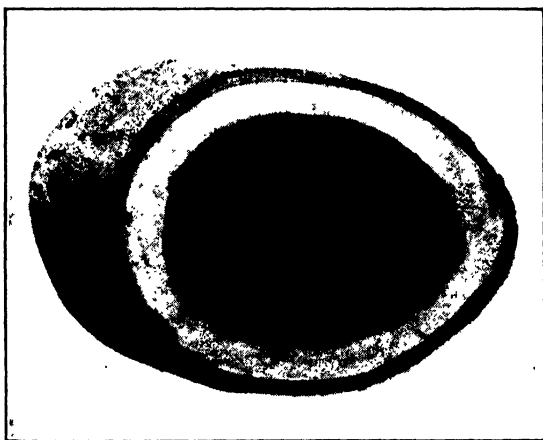


FIGURE 201.—Winter injury in the interior of the trunk of a young Stayman Winesap apple tree, showing the blackened heartwood and one year's growth of new sap wood

to fruit trees may be cited as an example. Exactly the opposite type of injury may occur on the immature twig tips of rose bushes, raspberries, or even of young fruit trees at times.

Root drowning, which results in the death of the root hairs or the young feeding rootlets, constitutes a very common trouble with fruit trees and other crops. Nitrogen starvation, potash starvation, and even lime or magnesium hunger and similar nutritional troubles are often definitely tied up with excesses of rainfall occurring previous to the development of these symptoms. All plants must have their normal quantity of water, either from rain or from artificial irrigation, and they suffer in varying degrees from drought if water is insufficient; but most plants suffer even more violently and die more quickly from excess of water. With certain plants excess of atmospheric humidity is scarcely less important than soil moisture. In actual practice the two go together. Plants growing with an excess of moisture and an excess of humidity form large, tender, sappy leaves which are ill prepared to stand excessively hot, dry

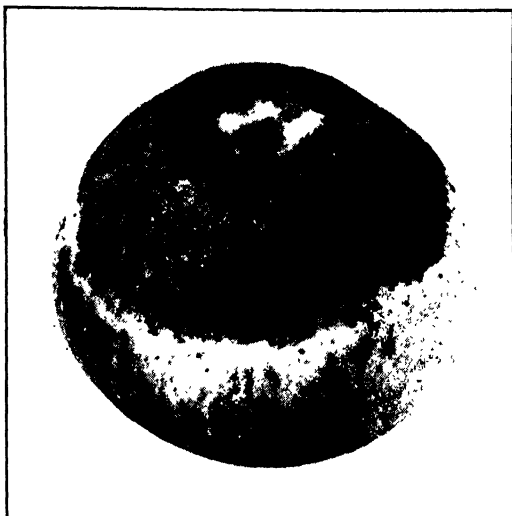


FIGURE 202.—Russet hand on apple from frost injury produced at the blossom period. Photographed in August



FIGURE 203.—Frost blisters on the under side of apple leaves, the result of April frosts on very young leaves. Photographed in June

sunshine or drought, and the reverse is also true. After dry weather the leaves can not stand rain. Much of the suffering of plants from moisture relations results from violent changes. While plants need a certain quantity of rain and atmospheric humidity and a certain quantity of moisture in the soil, they suffer seriously from excess of rain. Not only does excessive rainfall affect a plant directly in physiological disturbances, but rains and humidity

furnish the infection periods for most of its fungous parasites that produce disease.

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WHEAT-PRICE Analysis Requires Comprehensive World-Market Reports

It is commonly said that the world supply determines wheat prices. The contribution of the United States to the world's wheat production is only about one-fourth of the total outside of Russia and China. Consequently the variations in the wheat crops of the United States have a rather limited influence upon prices generally. In 1923, for example, when the United States had a crop of only 797,000,000 bushels, the average farm price in the United States was 92 cents per bushel, whereas, in 1924 a crop of 864,000,000 bushels sold at an average price of \$1.28 per bushel. The reason for the difference in the two years is that the world crop of 1924 was 400,000,000 bushels less than that of 1923.

The carry-over of old wheat must also be taken into account. The world wheat crop of 1929 was about 500,000,000 bushels less than the crop of 1928, but the carry-over at the beginning of the season was about 140,000,000 bushels greater than at the beginning of the

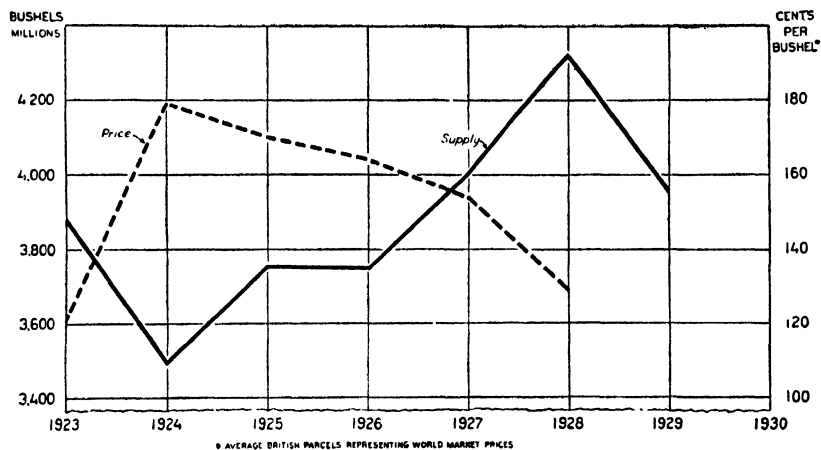


FIGURE 204.—World wheat supplies and prices. A small world supply of wheat caused prices to be high in 1924 and larger supplies lowered the price for each succeeding year through 1928

1928 season. This addition to the carry-over has the same effect as a similar addition to the crop.

The effect of world supply upon wheat prices can be judged from a study of the relation of world supplies to prices in world markets during the past few years. Figure 204 shows world supplies and prices for the years 1923 through 1928. Prices rose from 1923 to 1924 on account of a great reduction in the crop, and then declined through the five years 1924–1928 on account of increases in the world's supply.

Upward Trend in Demand

The accompanying chart, Figure 204, shows that in 1928 a supply of wheat much larger than that of 1923 sold at higher prices. This indicates clearly that there has been an upward trend in demand through these years 1923–1928. Wheat requirements of these world are constantly growing. In the 25 years preceding the World War the wheat supply of the world increased at a rate of about 74,000,000 bushels

per year, and yet the price of wheat did not fall. Prices of wheat in the United States rose through most of the period, along with the rise in the general price level. In the past few years, 1923 to date, it appears that the world would take, on the average, about 70,000,000 bushels more wheat per year without reducing prices. In other words, in relation to the demand for wheat, the world's supply of 3,877,000,000 bushels in the 1923-24 season would be equivalent to about 4,297,000,000 bushels in the 1929-30 season. Stated in another way, 4,297,000,000 bushels of wheat could have been disposed of in the 1929-30 marketing season on the basis of about the same prices as were realized for the 3,877,000,000 bushels available in the 1923-24 season.

After determining that changes in world supplies cause changes in world prices, and that there is an upward trend in demand which is the equivalent of about 70,000,000 bushels a year without changing prices, the next question is, How can we determine the probable world price level for any given season after we have a fairly reliable estimate of the world's supply?

Adjusting the supply of each of the past few years to that of the past season by adding 70,000,000 bushels a year for each of the years 1923 to date, and studying the relation of this supply to price, we find that there is a measurable relationship. The relationship is shown in Figure 204. This chart shows that on the basis of the demand for the 1928 crop, a supply of a little over 4,200,000,000 bushels would result in a price of about \$1.28 per bushel in British markets, and that a supply of about 3,750,000,000 bushels would sell for nearly \$1.80 a bushel. Prices for variations in supply between these two figures can be estimated approximately along this line. To determine an approximate average price for any subsequent crop, for example, it is necessary to move the line over to provide for the addition of 70,000,000 bushels annually to the demand. Should the world's supply for the 1929-30 season, for example, have been 4,000,000,000 bushels, the average price of wheat on British markets would probably have been a little over \$1.60 per bushel. One hundred million bushels more or less than four billions would have increased or reduced the price by about 14 cents per bushel.

Demand Conditions Vary Somewhat

In the past six years prices have varied somewhat from the straight line drawn through the chart in Figure 205, and it is never certain that the average price for any subsequent season will fall exactly on the line adjusted for the trend of demand to that season. There is a tendency for demand to increase at the rate of 70,000,000 bushels per year, but conditions vary somewhat from year to year.

The relation of the price of wheat in the markets of the United States to British prices depends upon the cost of transferring this wheat to the British markets, and the supplies of the different classes of wheat in the United States. For the United States to sell wheat on the British markets, prices must be low enough in relation to the prices in those foreign markets to be profitable to ship the wheat to these markets. When the United States has a very large crop of hard winter wheat, prices must be on an export basis for most of the year to dispose of the surplus. Under these conditions prices at Kansas City for export wheat will average about as much as the transfer costs below prices at Liverpool. On the other hand, when the hard winter wheat crop is short, as it was

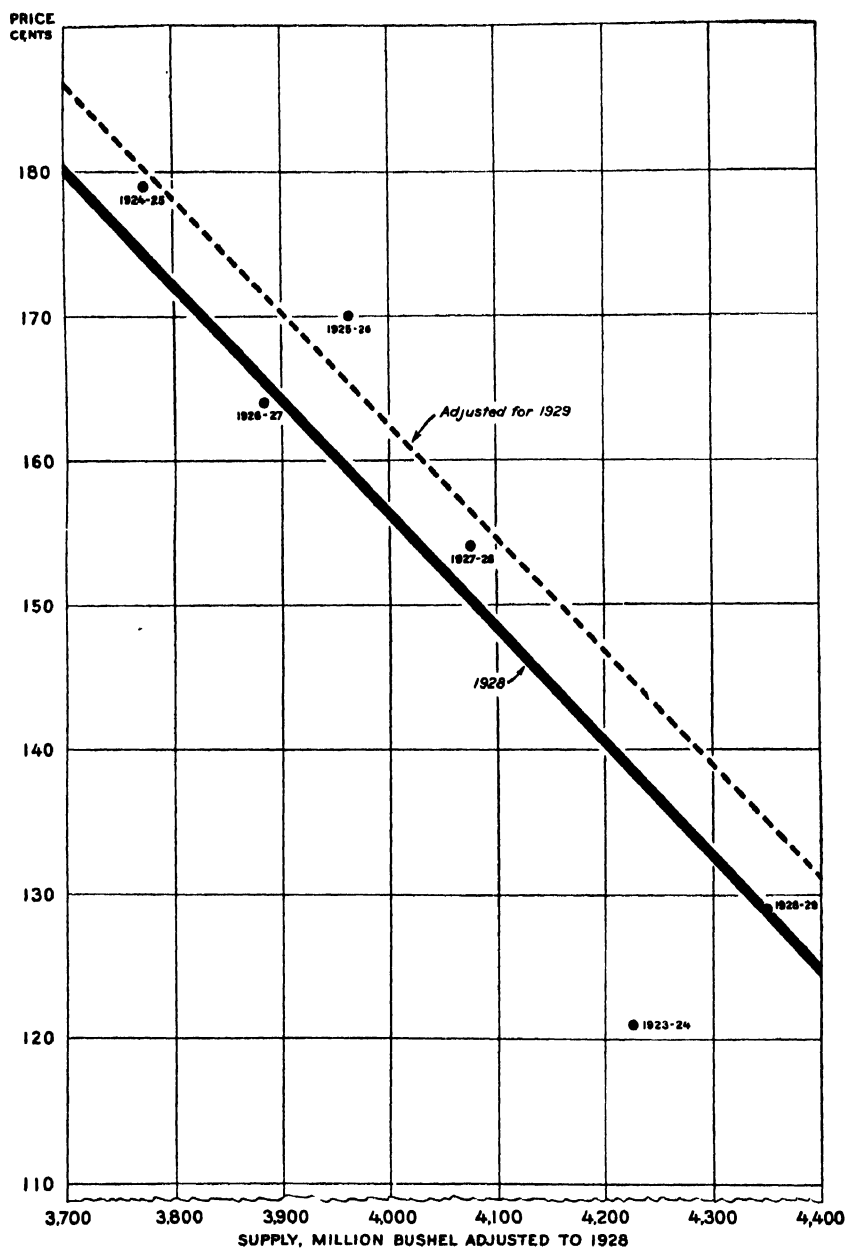


FIGURE 205.—World wheat supplies and prices 1924-25 to 1928-29. For the past few years the relation between the supply and price of wheat has been such that an increase or decrease of 100,000,000 bushels in the total world supply has been accompanied on the average by a decrease or increase of about 8 cents per bushel. In addition there has been an annual increase in world demand of about 70,000,000 bushels

in 1925, most of that wheat may be wanted in the United States, and domestic millers will bid up the prices above an export basis to prevent the wheat from being exported. In estimating the price of wheat at Kansas City, therefore, it is necessary to take into account not only the necessary price margin for export but also the quantity of the surplus of hard red winter wheat to be exported.

The relation of supply in the United States to usual domestic requirements is an important factor in determining the prices of other classes of wheat in the United States. The supply of soft red winter wheat has been short of domestic requirements in four out of the past six years, and in those years the prices of that class of wheat in St. Louis have averaged above those of hard red winter wheat (fig. 206), which has been on an export basis most of the time. When the supply of soft red winter wheat amounts to about 200,000,000 bushels, the price of that class in St. Louis will average about the same as that of hard red

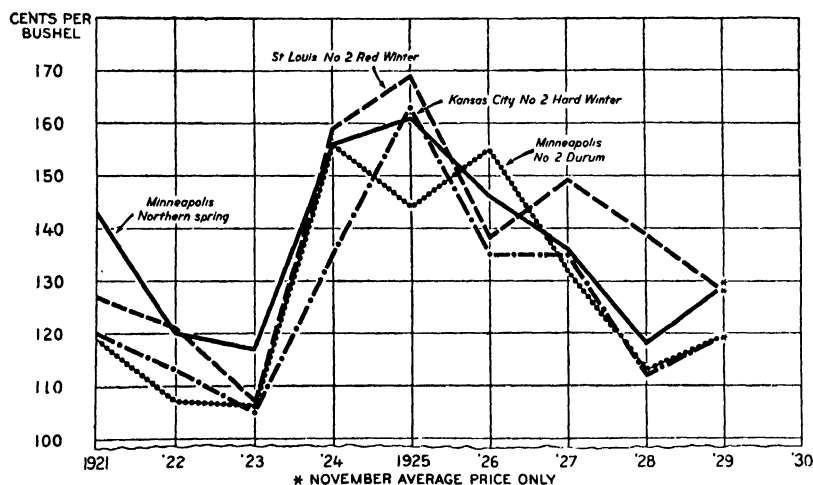


FIGURE 206.—Prices of wheat by classes 1921-1929. Although the prices for each class of wheat are dominated by the general world wheat situation, they also depend upon the supply of the particular class relative to the demand for it

winter wheat when it is on an export basis. The hard red spring wheat crop has been short of domestic requirements in three years out of the past six, and it is now short. When this crop is short the tariff protects it against the importation of Canadian spring wheat, so that the price of this class of wheat can rise above an export basis. The white and durum wheats are usually on an export basis and their prices are determined largely by foreign competition and the demand in foreign markets.

Factors Influencing Durum Wheat

Although durum wheat prices are affected to some extent by the size of the world crop and the prices being paid for other types of wheat, they are mainly dependent upon the world's production of durum wheat. When the crops of North Africa and Italy are short, there is likely to be a good demand for durum wheat from the United States and Canada; and when these crops are moderate, prices may be relatively high—even higher than those of the hard red spring wheat.

It is much more difficult to determine the probable course of prices during a season than to determine approximately the average price after the supply for the season is known. The course of prices during the season is affected not only by the available and prospective supplies but also by the various conditions of the market and the location of supplies. One method of judging the probable course of prices during the season is to determine first the probable average for the season in relation to average prices of previous years, and then to compare other conditions of the current season with those prevailing in other years. For example, early in the past season it became apparent that the supply and demand conditions were similar in many respects to conditions prevailing in the 1923-24 season, and conditions to date in the present season appear to be similar to those prevailing in the 1924-25 season. (Fig. 207.) In making these comparisons differences

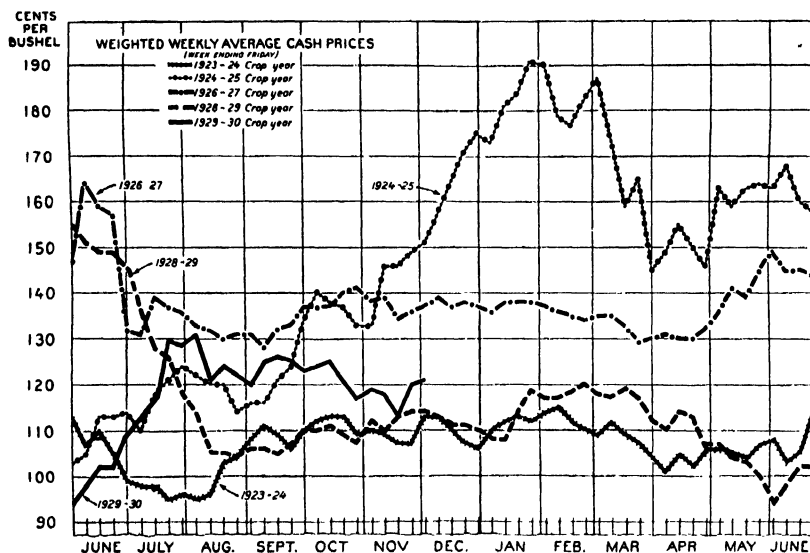


FIGURE 207.--Prices of No. 2 hard winter wheat at Kansas City 1923-24 to 1929-30. The seasonal trends of wheat prices vary greatly from year to year, but they tend to correspond for years having similar supply-and-demand conditions. After August, conditions in 1928-29 were much like those of 1923-24. In the beginning the 1929-30 season had many characteristics like those of the 1924-25 season.

must be taken into account in forming a judgment as to the probable course of prices for the season.

Although an analysis of the past relations of supply and demand conditions to prices usually provides a basis for determining approximately the prices to be expected for wheat in our principal markets, it must be observed that conditions are continually changing and that conclusions from past experiences must be modified continually as conditions change.

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WHEAT Protected from Black Stem Rust by Dusting with Sulphur

Black stem rust of wheat can be controlled and the yield and quality of grain increased by dusting the growing plants with very finely divided sulphur dusts. The essentials in preventing rust losses by dusting are the right kind of dust, applied at the right time with an efficient dusting machine.

That dusting will practically control stem rust, at least in experimental plots, is shown by the results of extensive experiments made in Minnesota in 1925, 1926, and 1927. In 1926, for example, at Crookston, Minn., there was 75 per cent of rust on Marquis wheat that had not been dusted, and the yield was 22 bushels an acre of wheat that graded No. 3 dark northern. On neighboring plots dusted three times there was only 5 per cent of stem rust and the yield was 29.5 bushels of wheat grading No. 1 hard spring. Plots dusted six times had only a trace of rust and yielded at the rate of 34.5 bushels an acre. The maximum increase in yield as a result of dusting therefore was 12.5 bushels an acre, although the stem-rust epidemic was not particularly severe.

In 1927, an epidemic year, the average yield from nondusted plots at Morris, Minn., was about 18 bushels an acre of Sample-grade wheat, while that from plots dusted three times at proper intervals was about 30 bushels of good wheat. At Crookston, Minn., in the same year, the nondusted plots had about 65 per cent of rust and yielded 25 bushels an acre of No. 5 wheat, while some of the dusted plots had only about 12 per cent of rust and yielded at the rate of more than 40 bushels an acre of wheat grading from No. 1 to No. 3. Experiments were made in 1928 also, but there was relatively little stem rust, and the results, therefore, were not conclusive. But it is evident that rust can be controlled if the right kind of dust is applied to the plants thoroughly and at the right time.

In order that sulphur dust may be effective it must be very fine, light, and fluffy, so that it may cover the plants thoroughly and uniformly and stick to them through wind and rain. Several satisfactory dusts are now on the market. Heavy dusts, consisting of coarse particles, are not satisfactory. Even the best dust in the world will not prevent rust, however, unless it is applied at the right time.

Spreads by Means of Spores

Wheat must be dusted before the rust spores reach it. The rust fungus spreads by means of spores, minute reproductive bodies about one five-thousandth of an inch long, produced in countless millions. They are blown about by the wind, germinate in droplets of rain or dew on wheat plants, and send their tiny germ tubes into the wheat, where they grow, branch, and rob the wheat of the nourishment needed for the kernels. This whole process of infection may require only a few hours. The sulphur dust prevents the spores from germinating or sending their germ tubes into the wheat plants, but it can do no good after the rust is once inside the plants. When, then, is the time to begin dusting?

The first application of dust, at least in the spring-wheat region, should be made about when the wheat is heading, as there usually are but few stem-rust spores in the air before that time. In some seasons this one application may be enough, but usually at least two additional applications, made at intervals of about a week, are necessary.

The proper times of application will differ, of course, in the different regions and must be determined for each region if dusting ever comes into practice. Timeliness of application is essential, but thoroughness is equally so.

In order to be thoroughly protected, wheat plants should be covered with a fine film of dust. This requires a specially constructed dusting machine which blows a fine cloud of dust onto the plants with such force as to insure uniform and effective distribution. Small hand dusters are often used in experiments, but horse-drawn or self-propelled power dusters, capable of dusting 50 to 100 acres a day, are required for practical work. Some of these machines have been tried and are at least fairly satisfactory, but improvement is necessary. The quantity of dust required depends somewhat on the efficiency of the dusting machine used, but from 20 to 30 pounds an acre usually are enough.

Economic Problems Involved

Is dusting a practicable method of rust control? That depends on the net return to the farmer. Good dust costs about 5 cents a pound, making the cost of materials for dusting an acre three times about \$3.75. The value of the grain broken down in dusting would be about \$2. Add man labor and horse labor, and the total, exclusive of interest and depreciation on the machine, would be about \$6 to \$8 an acre. The machines now on the market cost between \$400 and \$500 but are not yet entirely satisfactory.

Two problems must be solved if dusting is to be practicable. More efficient dusting machines must be devised, and it must be determined whether dusting will pay over a period of years, rust-free years and rust years. Manufacturers undoubtedly can perfect the machines—maybe airplanes can be used successfully—but no one can yet tell a farmer whether it would be profitable to dust year after year. It would help a great deal if the probability of epidemics could be predicted, but that is not yet possible. A wheat grower undoubtedly would make more money by timely and thorough dusting in a bad rust year, but he probably would lose money if he dusted when there was to be very little rust. The rust can be controlled with sulphur dust, but whether it would pay a farmer to dust for a period of years must be answered by long-time experiments made under practical conditions on the farm.

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WHEAT Requirements of Deficit Countries Have Grown Since the War

The demand for wheat in the countries of deficit production throughout the world has increased since the World War. Before the war the demand in countries that did not produce sufficient wheat to meet their own bread requirements created an average annual flow of wheat and wheat flour from countries of surplus production equivalent to 675,000,000 bushels. During the season 1927-28 world demand resulted in a flow of 818,000,000 bushels—an increase of 143,000,000 bushels. Profound changes have taken place at the sources of supply

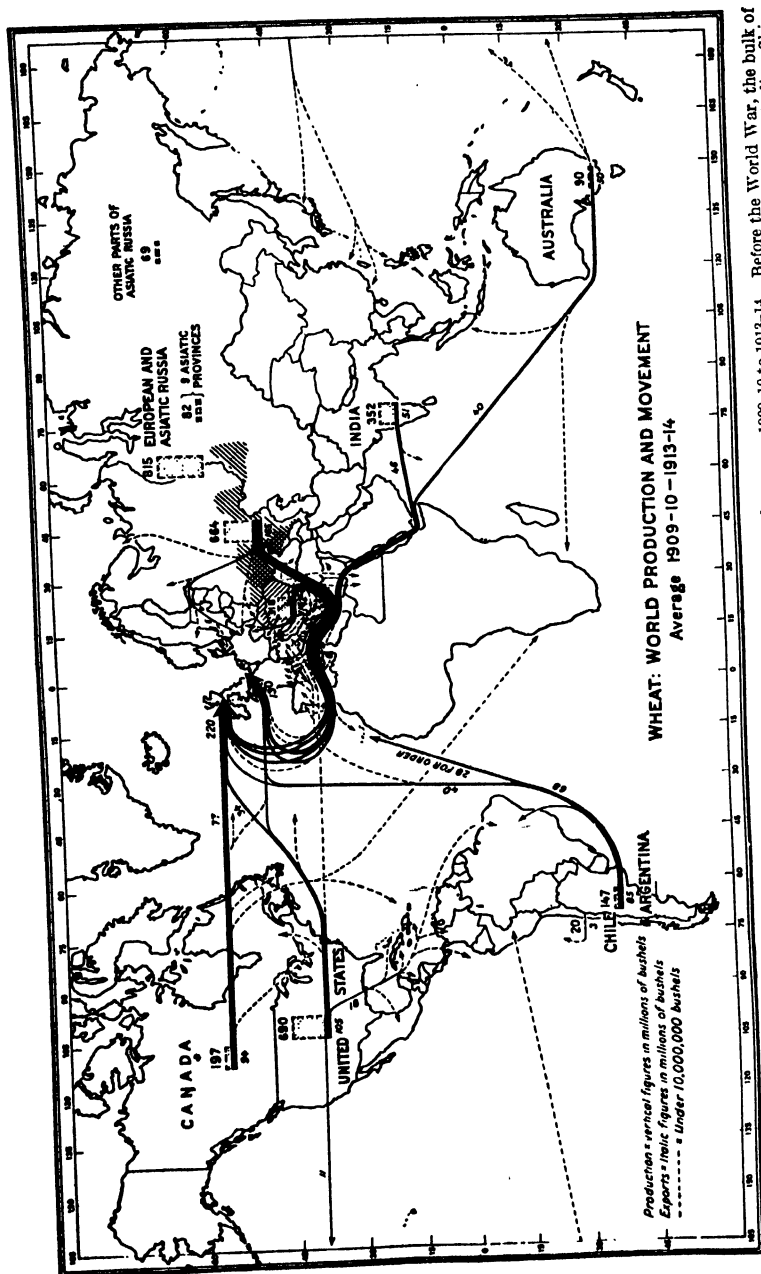


FIGURE 208.—Wheat, including wheat flour: World movement in response to world demand, average 1909-10 to 1913-14. Before the World War, the bulk of Europe's imported wheat supply passed westward through the Straits of Gibraltar from Russia, the Danube Basin, British India, and Australia. Shipments to Europe from the United States, Canada, and Argentina were incidental to the quantity of surplus produced in each country. The United States and Argentina supplied the wants of South America; Australia and Canada supplied the wants of Africa; the United States practically had a monopoly of the trade in the Orient. Port movements are not indicated on this map.

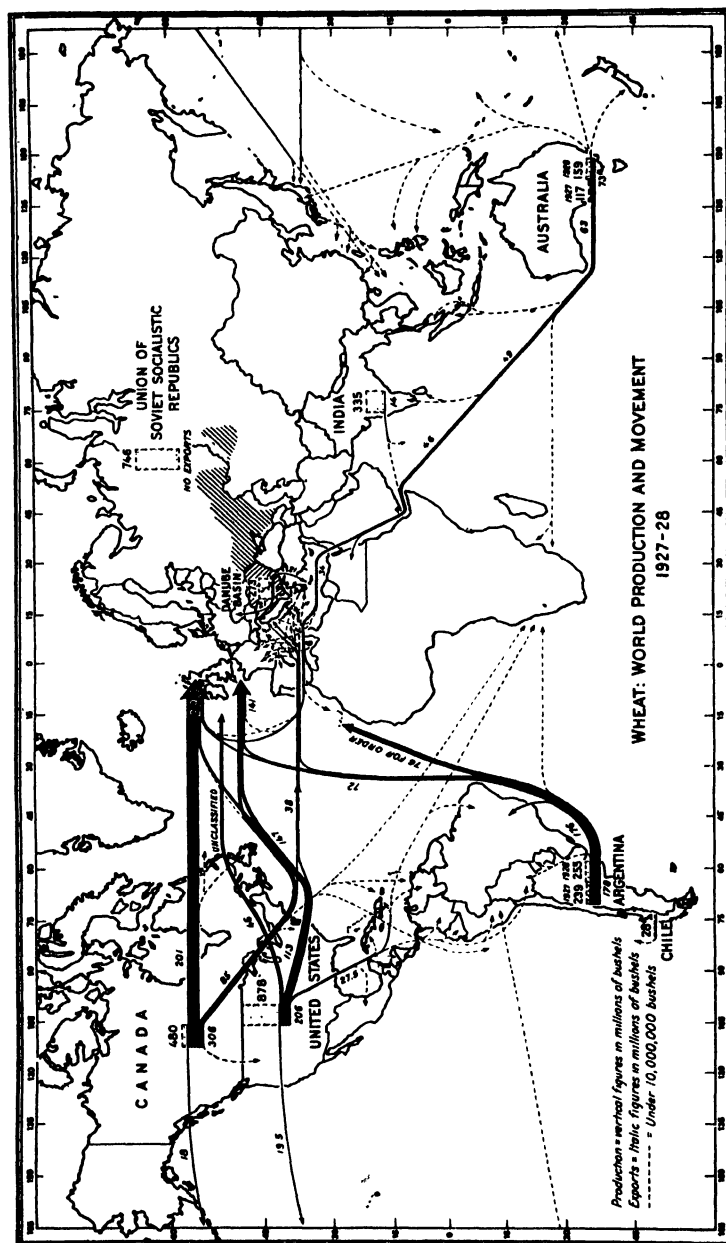


FIGURE 209.—Wheat, including wheat flour: World movement in response to world demand 1927-28. In 1927-28 the bulk of wheat supply passed eastward across the Atlantic Ocean from Canada, the United States, and Argentina. Russia was dropped out of the picture as a source of export wheat and the exports from the Danube Basin and British India have dwindled to 33,000,000 bushels and 9,000,000 bushels, respectively. Australian exports have increased. In every country of Europe, in the Orient, the West Indies, and South America, Canadian wheat and flour are crowding United States products in the world's markets. Port movements are not indicated on this map.

from which the deficit countries have been accustomed to seek sufficient wheat to cover their requirement of daily bread.

The peasants of Russia have eaten most of their wheat in recent years and this former giant competitor of the United States wheat farmer has practically disappeared as a factor in feeding western Europe. The peasants of Rumania are eating more corn and feeding more corn to their cattle and hogs. Corn production has taken the place of wheat production to a large extent and Rumania, too, has ceased to be a prime factor in western markets. India has eaten more and exported less wheat in recent years than before the World War. Under the influence of these and other factors the mighty stream of nearly 370,000,000 bushels of wheat that flowed westward as grain and flour, by rail overland and by ship through the Mediterranean to Italy and France and on through the Straits of Gibraltar, up the Atlantic, and through the English Channel to the United Kingdom, Belgium, Netherlands, Germany, and Scandinavia has dwindled to 83,000,000 bushels—a shortage in the eastern supply of 287,000,000 bushels.

Production in Europe

In spite of the nearness of their markets the farmers of Europe have found it increasingly difficult to meet on a competitive basis the rising flood of wheat from the Western Hemisphere and are producing less wheat since the World War. Only the best lands can profitably be seeded to wheat. Marginal lands have been put into more lucrative crops or allowed to run to grass as pasturage for dairy herds. In 1927-28 the farmers of deficit western Europe produced 984,000,000 bushels of wheat—34,000,000 bushels less than their pre-war average of 1,018,000,000 bushels.

The population of the cities and industrial districts of Europe has increased more rapidly than that on farms. This has increased the domestic demand for wheat, while the domestic supply has decreased. The cities and industrial regions of western Europe united in demanding the importation of 661,000,000 bushels of wheat in 1927-28, an increase of 62,000,000 bushels above the pre-war average. Part of this increased demand is accounted for by the 34,000,000 bushel decrease in wheat production in western Europe. Part is accounted for by increased population. About the middle of the pre-war period, 1909-1913, the population of Europe outside of the present boundary of Russia was about 340,000,000. By 1927, the population outside of Russia had increased to about 370,000,000. A large part of the increase of 30,000,000 inhabitants in Europe depend for their wheaten-bread supply upon sources outside of Europe itself, necessitating increased shipments from overseas. In parts of Europe the increased demand for wheat may be attributable to higher standards of living adopted since the war, though it is questionable whether the average rate of living in western Europe to-day is as high as it was before the World War.

Increased Call on the Western Hemisphere

The eastern supply of wheat for Europe, as noted above, had fallen off 287,000,000 bushels in 1927-28 and the demand had increased 62,000,000 bushels, which created a demand on the wheat supplies of the Western Hemisphere totaling 349,000,000 bushels greater than that of

pre-war days. Before the World War the United States, Canada, and Argentina shipped to Europe an average of 229,000,000 bushels of wheat. In 1927-28 the Western Hemisphere shipped 578,000,000 bushels of wheat across the Atlantic.

Canada has taken prompt advantage of the increased European demand and the decreased competition of Russia, the Danube Basin, and British India. Canada shipped to Europe during 1927-28 wheat and wheat flour equivalent to 271,000,000 bushels. Canada has an advantage in the British market and sent 198,000,000 bushels of wheat to Great Britain, as compared with 45,000,000 bushels from the United States and 20,000,000 bushels from Argentina. Canadian shipments to the continent totaled 73,000,000 bushels.

The United States shipped to Europe as grain and flour the equivalent of 159,000,000 bushels of wheat in 1927-28 against a pre-war average of 75,000,000 bushels. This represents an increase of 84,000,000 bushels or 112 per cent, compared with Canada's advance of 215 per cent. Argentina shipped 148,000,000 bushels of wheat to Europe in 1927-28, as compared with an average of 68,000,000 bushels before the World War—an increase of 80,000,000 bushels or 118 per cent. The volume of United States wheat flowing eastward is being squeezed and narrowed by the mighty pressure of wheat streams flowing across the Atlantic to the north and south of our own.

Competition in Oriental Markets

The United States wheat farmer is brought into sharp competition in Asia and the Pacific islands with the wheat growers of Canada and Australia. Before the World War this western demand created an average flow of wheat and wheat flour equivalent to 21,000,000 bushels. The corresponding movement was 60,000,000 bushels during 1927-28. Before the World War, the United States shipped the equivalent of 11,000,000 bushels, as wheat and flour, to the Orient and the Pacific islands. In 1927-28, the United States still held first place with 20,000,000 bushels; but Canada was a strong competitor with 18,000,000 bushels. Australia shipped to Asiatic and Pacific ports 17,000,000 bushels. Shipments from India to near-by points have undergone practically no change.

Africa has increased its demand for foreign wheat and flour from an average of 8,000,000 bushels during 1909-10 to 1913-14 to 26,000,000 bushels in 1927-28. Australia, the geographically natural source of supply, has increased its shipments of wheat to Africa from an average of 5,000,000 bushels before the World War to 21,000,000 bushels in 1927-28. Russia and the Danube Basin, which shipped about 1,000,000 bushels of wheat, each, to Africa before the World War, have dropped out of the picture. Canada continues to ship about 1,000,000 bushels annually. Argentina appears as a new source of supply and sent 1,000,000 bushels in 1927-28. In the same crop year the United States shipped the equivalent of 3,000,000 bushels, mostly flour, to South African ports.

The demand for wheat in South America before the World War called for exports from surplus countries averaging 26,000,000 bushels annually. In 1927-28, shipments of wheat to South American deficit areas reached 40,000,000 bushels. Argentina is the geographically natural source of supply for the South American wheat demand and

that country's shipments increased from a pre-war average of 17,000,000 bushels to 29,000,000 bushels in 1927-28. Australia continues its shipments of wheat to Peru of about 1,000,000 bushels annually. Shipments from the United States, for the most part flour, increased from the equivalent of 5,000,000 to 8,000,000 bushels. Canada appeared as a new source of supply, and shipped about 1,000,000 bushels in 1927-28. Chile produces a surplus of about 1,000,000 bushels that is shipped north to near-by countries.

Direction of Canada's Trade

Before the World War, Canada shipped 4,000,000 bushels of wheat annually to the United States, 1,000,000 bushels to Newfoundland, and 2,000,000 bushels to the islands of North America. In 1927-28, Canada shipped 8,000,000 bushels of wheat to the United States, 2,000,000 bushels to Newfoundland, and 5,000,000 bushels to the islands of North America. During 1927-28, Canada exported through United States ports 85,000,000 bushels of wheat. On the other hand, the United States exported 46,000,000 bushels of wheat through Canadian ports. This interchange of port facilities is a postwar development of the wheat trade of the two countries.

The United States shipped an average of 13,000,000 bushels of wheat to Mexico, Central America, Panama, and the islands to the south and east before the World War. Since the war this trade has increased to 16,000,000 bushels. These areas are the natural markets of the United States and serious competition from Argentina is not to be expected. On the other hand, Canada is rapidly gaining control of the markets in British insular possessions.

The outstanding feature of these changes in the demand for and supply of wheat throughout the world is the shift of Europe's chief sources of supply from Russia, the Danube Basin, and British India to Canada, the United States, and Argentina. Great Britain looks to Canada for most of the wheat destined for consumption in the United Kingdom, the United States supplying certain required grades.

On the Continent, the United States has maintained its trade in wheat more nearly on an equal footing with Canada and Argentina. Supplying the continental demand is a matter of grade, quality, and price.

In the Orient and Pacific Islands, increased Australian competition added to that of Canada has endangered markets, in which, before the World War, the United States held practically a monopoly.

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WHEAT Seed Cleaned and Treated for Smut by Portable Machine

Smut in growing wheat reduces the yield of the wheat. Stinking smut, or bunt, in market wheat reduces its market value. Smut in wheat pre-

sents a serious handicap to the efficient, economical marketing of the grain. All smutty wheat must be passed through smut-removing machines before it is suitable for milling purposes.

Stinking smut can be controlled effectively by any one of several simple treatments, except in areas where soil infestation occurs or

when the seed is heavily infected with smut spores. The most common treatment is to dust wheat with copper carbonate dust. All seed wheat should be thoroughly cleaned before dusting and before seeding, as proper cleaning removes the weed seeds from the grain. The dust is applied to the seed wheat at any time before planting. Both operations of cleaning and treating are necessary for most profitable wheat raising.

To encourage efficient cleaning and treating of seed wheat on the farm, the Bureau of Agricultural Economics assisted in designing, testing, and putting into operation, a portable combination seed-grain-cleaning and seed-treating machine for a group of farmers in California who started the project as a community enterprise. The machine, mounted on an automobile chassis, traveled from ranch to ranch on a schedule arranged by a local farm bureau committee supervised by the county agent.

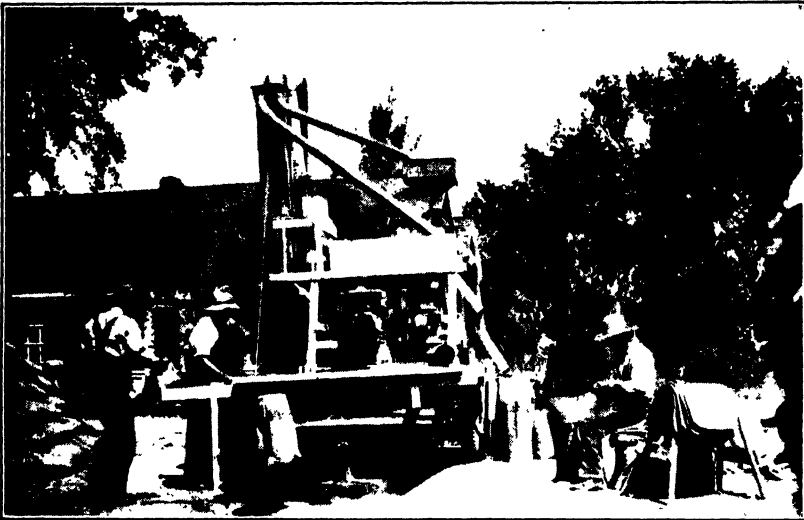


FIGURE 210.—Combination seed-grain-cleaning and dust treating machine in operation

The machine is operated by two men—an operator in charge who is with the machine at every farm and who supervises the work of cleaning and treating, and an employee of the farm who is temporarily assigned to the duty of sacking or otherwise removing the cleaned and treated grain from the machine.

Equipment Paid for the First Season

During the first season's operation the combination machine, which had a capacity of 60 bushels per hour, handled over 1,000 tons or about 33,000 bushels of grain. On the basis of a charge of \$2.50 per ton the equipment was paid for during the first season's operation from receipts of that year. In addition, the users of the machine were given a refund of about 55 cents per ton of grain handled. This made a net cost to the users of \$1.95 per ton or about 6 cents a bushel, including the cost of the copper carbonate dust. During the second season's operation the outfit handled about 1,500 tons of seed wheat, barley,

and oats, at a cost of approximately \$1.60 per ton, or about 5 cents a bushel.

The advantages of cleaning and treating seed grain by means of a portable outfit are manifold. The work costs the farmer less than if he has it done commercially or does it with his own equipment. If the work is done commercially the grain to be cleaned must usually be hauled from the farm to the warehouse or elevator and the cleaned grain must then be hauled back again.

In many instances the individual farmer who does his own cleaning and treating does not have the best equipment because of its comparatively high cost in relation to the quantity of work he has for it to do. A community cleaner gives the farmer an efficient machine run by an experienced operator; he is saved the work of purchasing and handling the copper carbonate dust; and the dust can be bought more cheaply in large quantities.

Foreign Material Returned to Farmer

Then the farmer has returned to him for immediate use the foreign material that is removed from the seed grain during the cleaning process. The foreign material frequently consists largely of cracked grains, wild oats, other grains, and other seeds that are usable as feed on the farm for chickens, sheep, or hogs.

The successful operation during these two seasons of the community-owned portable cleaning-and-dust-treating machine has led one manufacturer to construct similar outfits for use in the Pacific Coast States. The advantages of cleaning and treating in one operation have led several grain-cleaner manufacturers to put on the market combination cleaning-and-treating machines of smaller capacity than the portable outfit here described, which are designed primarily for individual farm use.

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WHEAT That Is Slightly Germinated Helps Flour When Sparingly Blended In the commercial grading of wheat, germinated grains are classed as damaged grains and no more than 2 per cent of such grains is allowed for No. 1 grade of wheat. For every per cent of germinated grains over 2 per cent a progressive deduction in the price per bushel is made. Wheat containing 10 per cent or more of germinated grains is generally considered unfit for milling, and unless excessively moldy or musty is used for feed purposes. When excessively musty it is fit only for fertilizer and other industrial purposes. Occasionally, however, a premium has been paid for slightly germinated wheat.

Weight Loss During Germination

Experiments have shown that a wheat seed allowed to germinate for 12 days under controlled laboratory conditions loses more than 90 per

cent of its potash, about 80 per cent of its nitrogenous substances and phosphoric acid, 30 per cent of its fat, 50 per cent of its pentosans, and practically all its stored-up starch material. The weight of the seed decreases more than 90 per cent during that period. These losses are for the most part due to the transfer of the reserve materials from the seed to the little plant, made possible by the action of the enzymes. These changes begin very soon after the seed has been placed in an environment suitable for germination. The same process takes place but to a much slighter degree in newly harvested wheat which has been subjected to frequent rains while still in the shock or stack. Long exposure to alternate wetting and drying may, however, cause appreciable damage to the harvested grain still in the field.

Wheat which has been allowed to germinate for no more than two days has undergone very little chemical change. As a result of longer germination the wet and dry gluten decreases, and sugar and acidity increase. It is difficult, if not impossible, to detect slightly germinated wheat by chemical analysis, except possibly by the determination of the diastatic activity, which in sound wheat is considerably less than in germinated wheat.

The loss in weight of a seed during germination ranges from 1.5 per cent in 24 hours to more than 10 per cent in 120 hours. When the plumule is one-fourth the length of the grain the loss is about 1 per cent; when the plumule equals the grain in length, the loss is nearer 3 per cent.

Effect of Using Sprouted Wheat

Wheat which has germinated so that the plumule is more than 1 inch in length should be sparingly used for milling. Not much more than 3 per cent of such wheat can be safely mixed with sound wheat. Too much sprouted wheat produces a dough with puttylike characteristics. The use of as much as 8 per cent of this wheat will yield an inferior loaf; but a small quantity of wheat germinated even to this extent is not harmful beyond a slight weakening of the dough. The quantity of germinated wheat which can safely be used depends upon the length of time the wheat has been allowed to germinate. If the wheat is only slightly germinated, that is, up to about three days, even 20 per cent can be used with success. It is safer, however, to use 20 per cent of wheat germinated three days than 10 per cent germinated five days.

In the process of milling, hard wheat which has germinated behaves somewhat like a soft wheat. Germinated wheat possesses a more or less brittle bran, yields a smaller quantity of flour, and may yield flour of a somewhat darker color than that from ungerminated wheat. In general flour milled from partly germinated wheat contains not only a weaker gluten but a smaller quantity of gluten. Such flour has a lower absorption than flour from ungerminated wheat. The absorption decreases with the quantity of germinated wheat or the length of time of germination.

The Penalty on Slightly Germinated Wheat

It is difficult to justify the practice of penalizing slightly germinated wheat found on the market in view of the beneficial effects which a small quantity of such grains produces in bread baking. Normally,

wheat flour contains very little sugar, in fact, too little to satisfy the needs of the yeast in bread making. Owing primarily to the action of the diastatic enzyme upon the starch, germinated wheat has a relatively high sugar content, and the addition of germinated wheat to sound wheat therefore makes available to the yeast a sufficient quantity of fermentable sugars for the whole process of fermentation. Thus not only is the time of fermentation of the dough reduced, but likewise that of proofing; a greater quantity of gas is produced, and the baked loaf has a larger volume. Further, the use of a small quantity of flour made from germinated grain improves the texture and color of the crumb, produces a browner and more pleasing crust, and imparts a desirable flavor to the bread. In fact some experiments have shown that even 20 per cent of slightly germinated wheat improves the quality of the bread. When used with sound wheat of low diastatic activity, germinated rye and other grains as well as germinated legumes may play the same important rôle that germinated wheat does in baking bread.

Considering the importance of the subject, data on the use of flour made from germinated grains in baking are very meager. Among the problems to be investigated are (1) the transformation which takes place in the seed during germination, (2) the effect of various combinations of sound and germinated grains, (3) the effect of flour from germinated grains other than wheat, and (4) the effect of flour from germinated grains of various kinds upon baked products other than bread.

Very little if any work has been done to determine the effect of using flour from germinated grains and legumes in the making of macaroni, biscuits, crackers, cake, etc., and to ascertain the kind of self-rising flour that can be made from them. A very recent development is the discovery that flour from germinated legumes exerts a bleaching effect upon wheat flour. The possibilities here are many, and this field of research is practically untouched. Many other problems regarding the effect of the various germinated grains and legumes on the products of the bakeshop await solution.

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WOMEN Study Factory Products as Aid to Efficient Purchasing

The home of to-day represents the result of factory production quite as much as it does the home maker's own activities. Rural home makers are recognizing this fact and are studying their responsibilities as purchasers of commercially manufactured products used in their homes. Studies, conducted through home demonstration work in many States, are made of such widely divergent articles as textiles for the house; garments and underclothing; shoes; hosiery; clothing accessories; staple, fancy, and fresh groceries; furniture; sick-room appliances and household medicines; water, lighting, and heating systems; refrigerators; sewing machines; wall and floor coverings; electrical equipment for the home; motor power for the house; paints, wall paper, and calcimine; various types of cooking, cleaning, and laundering equipment; beds and bedding; china; silverware; glassware; cutlery; and the like.

Accessories for personal and for household use are also studied, including clothing accessories such as dress trimmings, neckwear, handbags, umbrellas, scarfs, jewelry, and hair ornaments. Household accessories studied include pictures, magazines, books, draperies, curtains, lighting fixtures, pottery, and similar items.

Analysis of products is made from a standpoint of basic material used, conditions and processes of manufacture, design, serviceability for personal need, and economy of purchase considered on the basis of cost and the intended use. The knowledge and experience gained through these studies have made farm women more intelligent buyers, who know the essentials of good material and construction, what to buy and when to buy, when it is economical to invest a relatively large sum, when a cheaper product may well take the place



FIGURE 211.—Home demonstration group comparing types of weaves in yard goods as part of a study of ready-made merchandise for the home

of a more expensive one, and other matters of basic purchasing economy. As a result farm women have broadened their interests and knowledge and have gained a keener appreciation of the value of articles manufactured under sanitary conditions, and where beauty and basic value given for value received are matters of accepted factory policy. In addition, farm women have become interested in matters of satisfactory conditions in factories, constructive legislation, community sanitation, and other factors of general well-being.

Study of Bedding

Typical of these efforts is the study of bedding which has been made by the farm women of Illinois during the last three years under the guidance of home demonstration agents and the extension special-

ist in home management. Women were taught desirable standards of beds and bedding. Emphasis was put upon such items as construction of mattresses, ticking, comparative advantages of different kinds of fillers, and labeling. State laws regarding bedding were studied and mattresses and pillows were opened and examined by the women. Visits to mattress factories were made by women in those counties where nearness made this feature feasible. A few manufacturers of high-grade mattresses cooperated in every way from offering samples of materials used to allowing the women to visit their factories to see the processes of manufacture and renovation. First-hand observation of what appeared to be a first-class mattress but which, when opened by the women at a local meeting, was found to contain factory sweepings, dirt, cigar stubs, and other materials in defiance of the law, aroused great concern.

With the third year of study and increased recognition of the importance of comfortable and sanitary bedding, the idea developed

of conducting a state-wide playlet contest to be based upon the theme of good mattresses. A state-wide committee of rural women was appointed. Four manufacturers who had already co-operated offered prizes for county, district, and State contests. The prizes for county and district contests were high-grade mattresses. The State contest prize included a box spring and mattress. Farm women in 84 community units



FIGURE 212.—Home demonstration groups analyze pictures and frames as part of their study of readymade merchandise for the home

wrote and presented skits and playlets before community groups. These were followed by 19 county or district contests. These districts represented a membership of from 8,000 to 9,000 women. Finally a state-wide contest was conducted at farm and home week at which time 600 people saw the eight competing teams present their playlets. The State committee with the aid of technical experts judged the plays. The State winners were invited to go with all expenses paid to Chicago and give their playlet before the annual meeting of the National Better Bedding Alliance.

The State home management specialist stated that over 2,000 people saw the playlets, and commented:

These contests have been remarkable in two particulars: First, in the expression of dramatic and playwriting ability of the women; and second, in the wide publicity it has given to the subject of choosing good bedding.

A demonstration by 4-H club girls on beds and bedding was given at the State fair as a result of the project. The project was considered so helpful by the rural women that the report of the State better-bedding committee of rural women concludes, "The com-

mittee suggests that this work be continued and a greater knowledge of better bedding be extended to the women of Illinois during the coming year."

Other Branches of Home Economics Study

Similar studies have been made in many phases of nutrition. Some of the matters considered were sources of food supplies, types of marketing (direct and indirect), steps in marketing (transportation, grading, inspecting, packing, processing, storing, distributing, financing), and cost of retailing.

In the field of clothing, yard goods and factory-made garments have been analyzed as to fiber, weave, suitability of material as to garment desired, cut of garment, seams, finishes, and seasonableness of style.

Similar analyses of household equipment and other home necessities are being made, and greatly increased knowledge by rural consumers is resulting.

Exhibits, lantern slides, and actual use of equipment in testing circles have supplemented the technical instruction, but testing in their own homes by rural women has been adopted as the basic plan of teaching.

In many States, the groups of women visit local merchants to see at first hand and to learn from them and from the home economics specialists the comparative values of available products of the kind studied by them.

In New York State, rural home makers and home-demonstration agents spent three days in studying the wholesale market situation. They visited the produce terminal pier, learned how fresh produce is selected and packed for the market, saw methods of handling, selling, and distributing products from the commission houses, and observed the methods used at railroad piers in handling various perishable commodities. Retail markets, cold-storage and refrigerator plants, stock-yards, poultry yards, the stock exchange, and railroad milk platforms were also visited as a part of their educational tour.

Since women buy 96 per cent of all dry goods, 87 per cent of all market products, 48 per cent of all hardware, and 11 per cent of all men's clothing, it is evident that the home maker of to-day should be trained regarding processes of manufacture and methods of marketing products.

A beginning in merchandising efficiency has been made by rural women, and their great interest in this field indicates that this type of instruction will be increasingly requested in any educational work undertaken by them. Such studies are to the advantage of all, for with widespread public knowledge of standards, manufacturing processes, and conditions of distribution, commercial groups can concentrate their efforts on matters of basic value rather than upon factors of superficial and unscientific appeal, and home makers recognizing real values will make purchases accordingly.

GRACE E. FRYINGER,
Senior Home Economist, Extension Service.

WOODLANDS Well Managed Bring in More Cash

The great variety of products that a well-managed farm woodland can supply is perhaps best exemplified in the Appalachian hardwood region. Here, at any given time, valuable species of all sizes are likely to be intermingled with those of little or no present value. If the stand were to be cut for one product or species alone, the possible income from the woodland would not be fully realized. Under careful treatment saw logs, veneer logs, crossties, telephone poles, mine timbers, fence posts, and other products may all be produced from the same area, each representing the best use of certain trees. Under such treatment, also, the woodland is allowed to maintain healthy growing conditions. (Fig. 213.)

The secret of this all-round productivity lies in the fact that all of these products need not be marketed at any one time. While the



FIGURE 213.—The well-managed Appalachian woodland tract will have sufficient trees of all sizes and species to furnish many kinds of products

necessary raw material is being produced by nature, aided by man, the question of just what product or products to convert it into should be governed by current market conditions. If prices are poor, or the present sizes of the trees render them unsuited to cropping for such products as will yield the best returns, their harvest may be deferred until conditions are favorable.

What can be done in the way of cutting a tract for saw timber and other crops and at the same time keeping it productive, is best realized from a concrete example of results actually achieved.

On a 40-acre hardwood stand in Webster County, W. Va., composed chiefly of white ash, red oak, and scarlet oak, with an admixture of soft maple, hickory, yellow poplar, and black gum, three successive cuttings have been made. Thirty years ago the first cutting, in the virgin stand, yielded 2,000 to 4,000 board feet per acre of selected oak and yellow poplar, leaving the woodland in a lightly culled condition. Growth on the remaining trees was slightly accelerated as a result.

The second cutting, 11 years ago, removed an average of 4,858 board feet per acre, two-thirds of this in the form of ties (fig. 214) and one-third in saw logs. This cutting also greatly improved the growing condition of the stand, for while it left standing the most rapidly growing young timber, enough of the stand was cut to allow plenty of

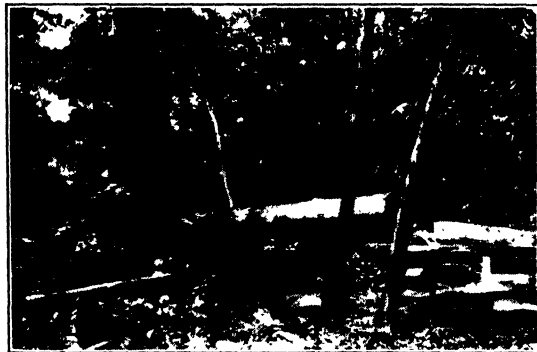


FIGURE 214.—Hewn oak ties bring a good income from the farm woodland

light to reach the remaining trees.

The last cut, 2 years ago, took a little over 2,000 feet per acre—half as ties and the rest as logs.

228 Trees to the Acre

The present stand averages 228 trees to the acre. Thirty per cent of these are 10 to 14 inch trees with a volume of 5,000 board feet, and the remaining 70 per cent are 4 to 10 inch trees with a volume of 245 cubic feet.

The smaller, healthy trees are mainly free. Hence there is ample opportunity for the growth of the vigorous young stock, wisely left uninjured in logging.

The trees now 10 inches and over will again furnish the farmer with ties and lumber within the next 20 years as the opportunity presents



FIGURE 215.—The better class Appalachian farm is confined to the better soils, leaving the poorer in woodland

itself. Sufficient smaller trees remain to take their places or, where these may later need to be thinned out somewhat, to furnish mine props or fence posts.

The total money yields from the two later cuttings, on the basis of prevailing prices, namely, \$28 per thousand board feet for ties and \$9 per thousand feet for saw logs, were \$4,205 and \$1,610, respectively.

This money, obtained from the 40 acres with no investment in extra equipment and with only the expenditure of the farmer's labor during the off season, has helped to buy additional farm machinery. Moreover, the prospects are that the income from this tract as long as the owner handles it judiciously will continue indefinitely.

Were he to clear this land for farming he would be handicapped by the sloping, uneven character of the ground. (Fig. 215.) At best he could crop it for several years, only to abandon it later. It would again grow forest crops, but much time would be lost before it could become as productive as it is now.

BERNARD FRANK,
Junior Forester, Forest Service.

WOOL of Long Staple is Most Profitable in Tests with Rambouillet Sheep

monly termed, is one of the most important. Close attention to breeding and management of range Rambouillet sheep is required to obtain a staple of wool from one year's growth which will exceed 2.5 inches. In fact, there are far too many fleeces which have staple lengths shorter than 2 inches.

Evidence that more consideration should be given to the length of staple in the breeding of range Rambouillet sheep is shown in the results of a study by the Bureau of Animal Industry of 1,460 fleeces produced at the United States Sheep Experiment Station at Dubois, Idaho. (Figs. 216 and 217.) This study clearly shows that the production of wool of full-length staple is more profitable with range Rambouillet sheep than the shorter staple generally produced.

It was found that as the length of staple increased the average weight of scoured fleeces also increased materially. With fleeces of from 3.1 to 3.5 inch staple the weight amounted to 47 per cent more than that of scoured fleeces with staple of 1.5 inches or less.

Among the many difficulties in producing wool which will meet the highest market requirements, the length of fiber, or staple as it is com-

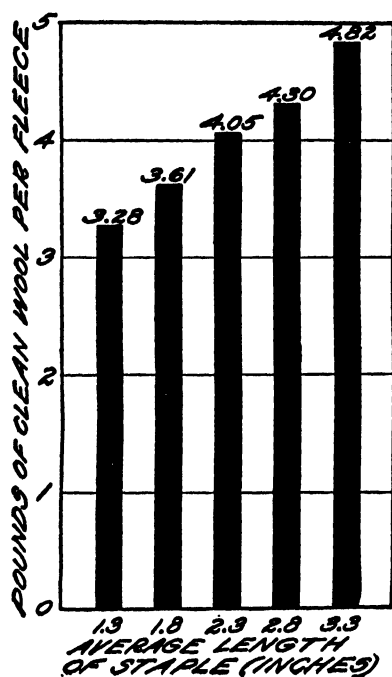


FIGURE 216.—Illustrating how length of staple is associated directly with weight of clean wool per fleece. There is a definite tendency for longer staple to occur in the fleeces yielding the heaviest weights of clean wool

Price per Pound of Long-Staple Wool Also Greater

The importance of length of staple to range sheep breeders is even more forcefully shown by a consideration of the financial returns from the 1,460 fleeces. The average value increased as the length of staple

increased, not only because of the increase in average scoured weight, but also because the price per pound of scoured wool increased from \$0.96 for the shortest length of staple to \$1.04 for the three longest lengths. With both the average weight of scoured fleece and the price per pound of scoured wool increasing as the length of staple increased, the average value of the fleeces with long-staple lengths was \$5.01, or 59 per cent more than that of fleeces with a staple length of 1.5 inches or less. The average value of the fleeces of the 1.6 to 2 inch group was \$3.61, or an increase of 15 per cent over the shortest-length group; that of the 2.1 to 2.5 inch group \$4.21, or an increase of 34 per cent; and that of the 2.6 to 3 inch group \$4.41, or an increase of 42 per cent.

The practical application that can be made of this increase in the length of staple is that, so long as it is consistent with other desirable

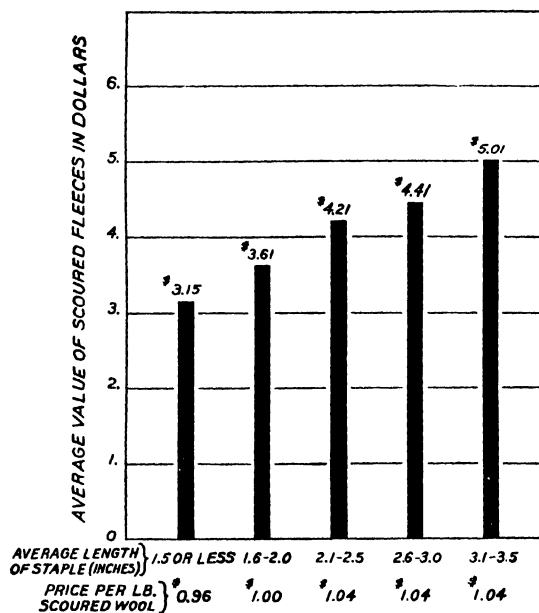


FIGURE 217.—Influence of length of staple of 1,460 Rambouillet fleeces on value of scoured fleece. Length of staple affects the value of fleeces, those having longer staple being worth more per pound and having more pounds per fleece

fleece qualities, such as good density, fineness, and character, length should form a major consideration in the breeding operations of the flock. It is highly important, if increased profits are to be obtained from range-sheep production, that rams and ewes having fleeces with reasonably long staple, good density, fineness, and character should be selected for the breeding flocks. Those with fleeces of extremely short staple on the other hand should be excluded. Such a procedure gradually increases the length of staple in the flocks of range sheep.

Breeders of purebred sheep who desire to keep accurate records will find it a comparatively simple matter to measure the length of staple of the fleeces of all sheep being selected for the breeding flock. This can best be done by parting the fleece of each sheep on the side, placing the end of a 6-inch rule against the skin in this part, holding the rule at right angles to the body of the sheep, and then reading the length of the staple as it extends along the scale of the rule.

This operation takes little time and the information obtained thereby enables sheep breeders to select for the breeding flock only rams and ewes that have a satisfactory length of staple. Continued breeding up, with this factor in mind, should give offspring with increased length of staple, thus obtaining a greater weight of scoured wool and hence materially increasing the profits obtained from the flock.

D. A. SPENCER,
Senior Animal Husbandman, Bureau of Animal Industry.

ZONING by Counties Promises Means of Rural Improvement Zoning practices in our larger cities have demonstrated that the best interests of the urban community are benefited thereby. Applications of the same fundamental practices in rural areas should prove of equal value to rural communities, and particularly to those communities where large areas of land are below the margin of successful cultivation as a result of recent changes in economic conditions.

Zoning in urban areas means the districting of available land for various classes of residential and commercial purposes in such a way as to provide the greatest benefits to the community. Zoning of rural areas should result in an economic classification of land for agricultural, forestry, recreational, and other purposes.

In urban areas, authorization for compulsory zoning is established and enforced under the police power. This is not true of rural zoning. Until such enforcement provisions as are desirable for successful rural zoning are established under police power, county boards of supervisors can undertake zoning programs, because they have the necessary authority to go ahead. In Wisconsin, tax-delinquent lands revert to the counties; counties may go into the timber-growing business, they may rearrange town boundary lines, they can discourage settlement and the establishment of schools and highways in submarginal agricultural areas, and they can encourage settlement in the better farming district.

Much Can Be Done by Counties

A study ¹³ of land-use problems in northern Wisconsin by the United States Department of Agriculture in cooperation with the Wisconsin College of Agriculture, led to the conclusion that, although the best rural zoning program is one that is not hampered by county boundary lines, much can be done by the counties in making a preliminary survey of land resources and basic economic and social factors. These results will be valuable in helping local authorities to deal wisely with their land problems pending the development of a more comprehensive State and Federal land policy.

A first essential of a county zoning program is the appointment of a committee by the county board to study land-use problems facing the board. This committee should be authorized to secure the services of a trained economist to plan and guide the taking of needed data and to complete the final report. The committee should be authorized to employ necessary clerical help and to employ well-informed town officers or old residents in each civil town to gather field data. The fact that local men know the location of farms, who the farmers are, the business of other landowners in the town and the location of the land owned by each, and the location of timbered tracts makes them invaluable cooperators.

County officers familiar with county records can be instructed to obtain tax-delinquency, school, and financial data. By cooperating with local industries the necessary information relative to industrial development in the county may be obtained.

¹³ HIBBARD, B. H., HARTMAN, W. A., and SPARHAWK, W. N. USE AND TAXATION OF LAND IN LINCOLN COUNTY, WISCONSIN. Wis. Agr. Expt. Sta. Bul. 400, 38 p., illus. 1929.

HIBBARD, B. H., SWENEHART, J., HARTMAN, W. A., and ALLIN, B. W. TAX DELINQUENCY IN NORTHERN WISCONSIN. Wis. Agr. Expt. Sta. Bul. 309, 28 p., illus. 1928.

Recording of Data Necessary

All field data should be recorded on schedules prepared in such a way as to facilitate transferring results obtained directly to base maps from the schedules. With the exception of certain financial, tax, school, and industrial data, the results of the survey can be pictured on these maps.

An important map used in the Wisconsin study pictured the area, location, and tax-deedable status of nontax-paying lands in the county represented by tax certificates which have not been sold to private parties. (Fig. 218.)

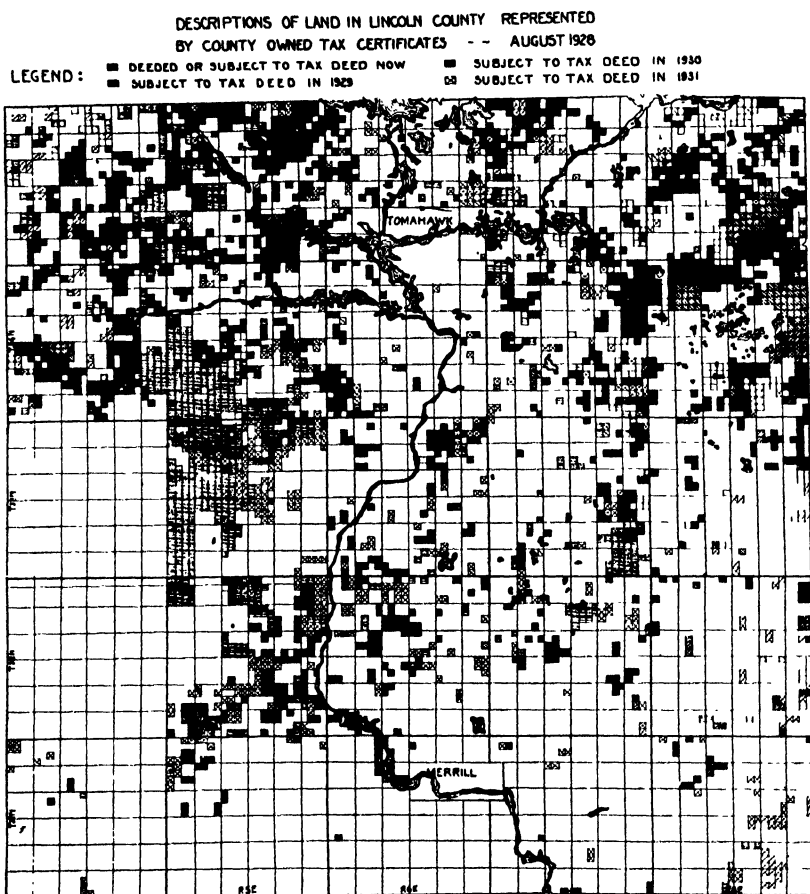


FIGURE 218.—The area of land in Lincoln County, Wis., represented by county-owned tax certificates in August, 1928. In Wisconsin tax certificates are subject to tax deed after the third year. Large areas of nontax-paying lands cripple county and local civil-town finances, but at the same time place local authorities in strategic position to develop rural zoning programs

A second tax-delinquency map showing the area and location of all tracts of land against which there is one or more unredeemed tax certificate, regardless of ownership, is important because many speculators in tax certificates who are unable to resell are allowing the lands represented thereby to revert to the county, and if the certificates are sold the land usually reverts to the county a year or so later.

A land-not-in-use map shows a potential source of county-owned lands. By the term "land not in use" is meant all abandoned farm

land and all other unplatted lands not covered with a commercial crop of timber, nor included in operated farms, nor used for recreational or industrial purposes. Location of abandoned and operated farms can be pictured on a separate map to indicate the unsuccessful and successful farming areas. The agricultural-marketing centers by types of markets may also be indicated on this map.

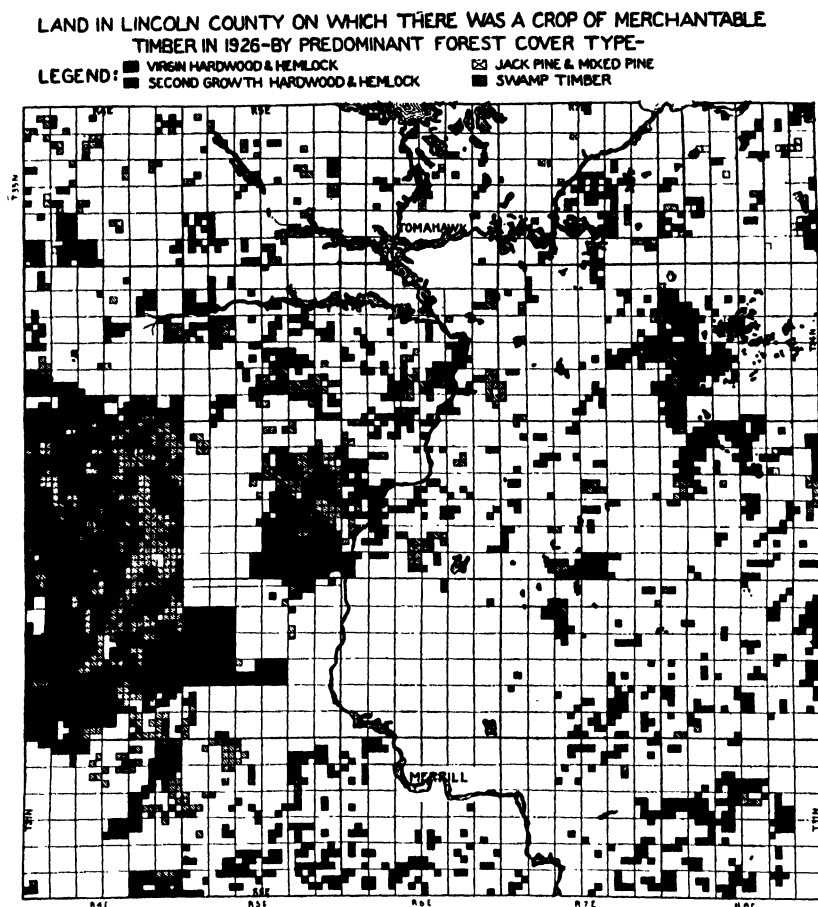


FIGURE 219.—The major part of the land in Lincoln County, Wis., on which there was a crop of merchantable timber in 1926 was in one large block. Many owners of these timbered lands are allowing them to go tax delinquent as soon as the timber is cut. This policy would be changed by a rural zoning program

Land Under Merchantable Timber

An important part of "land in use" to be mapped is land covered by a crop of merchantable timber. This is true (1) because timbered land is a major source of future county-owned land (after the timber has been cut), and (2) because such a map will help determine the degree of importance and practicability for taking steps to block out forest units to supply local industrial needs and the possibility of using certain areas of growing timber as nucleuses for potential forest units. (Fig. 219.)

Ownership and intent of ownership of land can be pictured on a map as the basis for a more intelligent understanding of the practicability of blocking out agricultural, recreational, industrial, and forestry units. Local officials, old residents, and abstractors are in position to record fairly accurate information on these factors.

A soil map and a map picturing other physical characteristics of the land are of utmost importance but are difficult to obtain unless the area has been surveyed. If soil maps are available, the different soil factors can be grouped and mapped as four or five soil types on the basis of their value for the type of agriculture predominating in the district. If no soil survey maps are available, effort should be made to picture the general location of these four or five types of soil.

With such facts as here outlined, in addition to an analysis of county and town finances with particular emphasis on expenditures and source of funds for schools and highways, supplemented by a fair degree of statesmanship and courage, county authorities are in position to take definite action toward the solution of land-use problems.

W. A. HARTMAN,
Senior Agricultural Economist,
Bureau of Agricultural Economics.

DEPARTMENT PUBLICATIONS

List of new Farmers' Bulletins, Leaflets, Department Bulletins, Technical Bulletins, Circulars, Miscellaneous Circulars, Statistical Bulletins, Miscellaneous Publications, Reports, and other numbered and unnumbered publications, issued from January 1, 1929, to December 31, 1929, classified by general subject matter

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PRICES OF FARM PRODUCTS GRAPHICALLY PRESENTED

Charts Showing Changes in Prices from 1910 to Date, Cycles, and the Relation of Supplies to the Prices of Some Farm Products.

Prepared under the direction of the Statistical Committee: O. C. Stine, chairman, L. B. Flohr, secretary, J. A. Becker, S. W. Mendum, C. A. Burmeister, and L. M. Davis

The charts of farm prices are grouped in the following order:

- (1) The farm prices of the principal agricultural products, monthly and annually, January, 1910, to December, 1929, in comparison with index numbers of the prices farmers pay for commodities they buy.
- (2) Cycles in the prices of some important farm products.
- (3) The relation of prices to supplies of some of the principal farm products.

Farm Prices

The farm prices represented in these charts are average prices received by or paid to farmers throughout the United States for all classes and grades of the product. For a description of the character of the price data, see Department Bulletin 1480, *The Reliability and Adequacy of Farm Price Data*.

The retail prices shown on each of these charts are averages of prices reported paid by farmers for many commodities which they buy. They include prices paid for food, clothing, furniture, building materials, machinery, fertilizer, and other items of equipment and supplies. For a description of the index number of retail prices, see *Index Numbers of Prices Farmers Pay for Commodities Purchased*, by C. M. Purves, a mimeographed circular of the United States Department of Agriculture issued in August, 1928.

Prices farmers receive for their products are also presented in the form of index numbers of all farm prices and of important groups of farm products. The index number of farm prices shown in Figure 23 represents a combination of the prices of 30 products through 1925, and 27 products thereafter. The complete list and method of construction of these index numbers will be found in the Supplement to *Crops and Markets* for August, 1924.

Reviewing prices of farm products presented in the figures that follow it will be observed that during the years 1910 to 1914 prices were fairly stable. During this period the price fluctuations for most products were not great and were neither markedly upward nor downward. This period has been used as a base for constructing index numbers to show the movement in prices of commodities and groups of commodities. In most cases prices turned upward very soon after the war began in Europe and rose very sharply in 1916 and 1917 when the United States entered the war. In some cases the rise in prices was due to unusual war demands. In all cases inflation was a factor in raising prices to higher levels. Farm prices generally increased sooner and more rapidly than the prices of the commodities farmers buy and the average of all commodities. Deflation and a business depression in 1920 and 1921 caused practically all prices to fall, some falling sooner and more rapidly than others. After the depression of 1921 prices of farm products rose more or less gradually to 1925, declined

into 1927, and then turned upward again into 1928. In the meantime the prices of commodities farmers buy had also declined, but not to a level so low as the prices of farm products. Since 1921 prices of commodities farmers buy have fluctuated to some extent but have remained on a level a little more than 50 per cent above the pre-war base. The upward trend of farm products, however, has had a tendency to improve the purchasing power of these products in relation to commodities farmers buy.

Price Cycles ¹

The prices of many farm products move in cycles with varying degrees of regularity and length. The prices of some crops have a tendency to move in cycles, but as a rule the crop-price cycles are irregular and uncertain. The prices of livestock and livestock products, on the other hand, generally present more or less fairly regular and definite cycles. It is commonly known that hog prices move in cycles of from three to six years in length. The tendency of farmers to plan to produce more when prices are high and to curtail production when prices are low or unsatisfactory causes these cycles. In the case of hogs, the relation of the price of corn to the price of hogs is an important factor in determining the character and extent of the cycle. The sheep and cattle cycles are necessarily longer than the hog cycles because in both of these cases more time is required to make any material change in production. The cycles in butter production are not quite so well defined as are those in beef production, but they are also of considerable length.

The Relation of Supply to Price

The supply of a farm product is an important factor in determining price. In some cases it is the supply within the United States that is most important in determining price, while in other cases the foreign supply may be more important than the home production. The relation of wheat supplies to prices is dealt with in another part of this Yearbook. The relation of supplies to the prices of several products, including apples, potatoes, hogs, and cotton, is presented in charts hereafter.

In studying these charts it will be of interest to notice how prices decline as supplies increase or rise as supplies decrease. It will be noticed that in some cases small crops sell for more than large crops, and in other cases a large crop may sell for more than a small crop. These charts present a first step in an analysis of prices. In any case in which the relationship of supply to price has been determined, other conditions remaining the same, the probable average price for the season of any given quantity of the commodity can be estimated from these charts. In using these charts we must not overlook the fact, however, that other conditions, including changes in the general price level and changes in demand help to determine prices. In these charts changes in general price level and in demand have been eliminated but in making an estimate of a price for any season they must be taken into account.

¹ In actual prices the cycles are sometimes obscured by changes in the general level of prices. To show the cycles clearly, therefore, it is necessary to divide actual prices by some index number which tends to reduce all of the actual prices to a common base price level. To show cycles in all cases the actual prices have been converted to a common price-level basis.

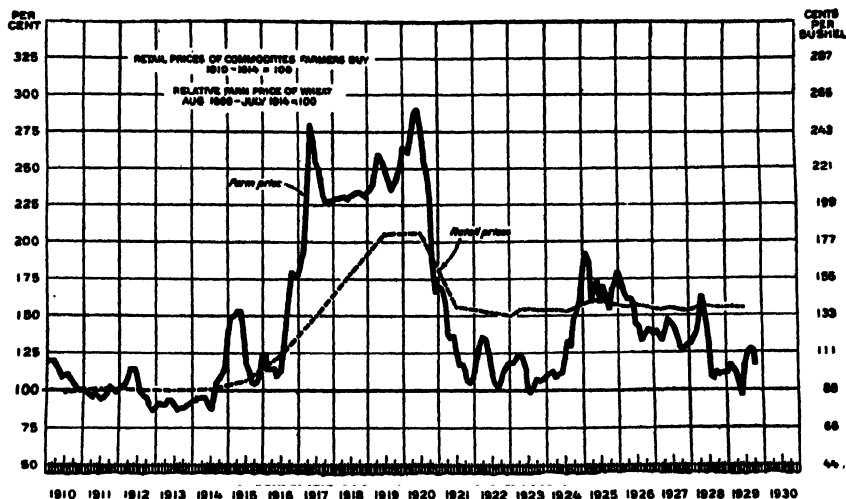


FIGURE 1.—FARM PRICES OF WHEAT AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Farm prices of wheat rose more rapidly and higher during the war than did retail prices of commodities farmers buy. In 1920 and 1921, however, wheat prices fell more rapidly and, most of the years since the war, have remained below the prices of commodities farmers buy. Year-to-year changes in wheat prices are due largely to changes in world production but also depend upon whether the various classes of wheat in the United States are on a domestic or an export basis.

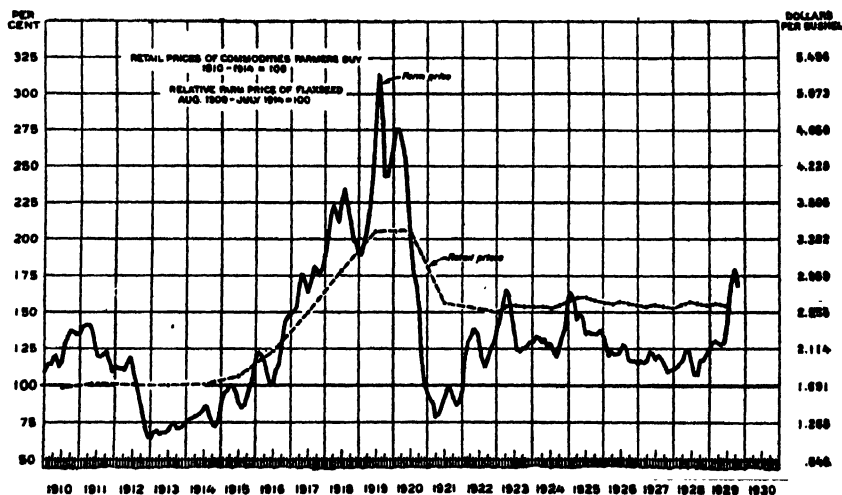


FIGURE 2.—FARM PRICES OF FLAXSEED AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Farm prices of flaxseed rose a little more during the war than the prices of commodities farmers buy. Since the war flaxseed prices have averaged lower, as compared with pre-war, than prices of things farmers buy. Yearly fluctuations of flax prices are dependent partly upon the flax crop of the United States but also upon the production of other countries, especially Argentina and Canada. As the United States has a high tariff and is on an import basis, however, prices are higher than the world-market basis.

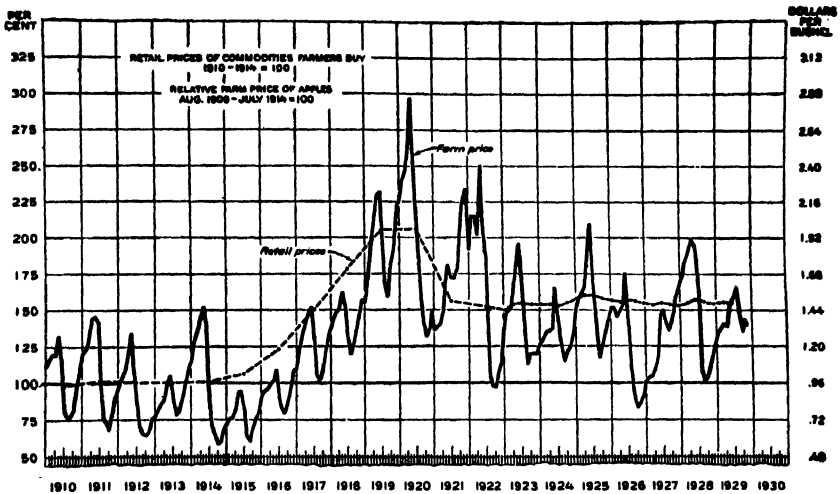


FIGURE 3.—FARM PRICES OF APPLES AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Apple prices are influenced from year to year very largely by the variations in the size of the apple crop. Usually there is a very pronounced decline from the high prices of summer apples in June and July to the lower prices for the main crop in September, October, and November. Thereafter they usually advance considerably with the depletion of the season's supply. The late European war at first depressed apple prices, but later inflation lifted them far above pre-war level.

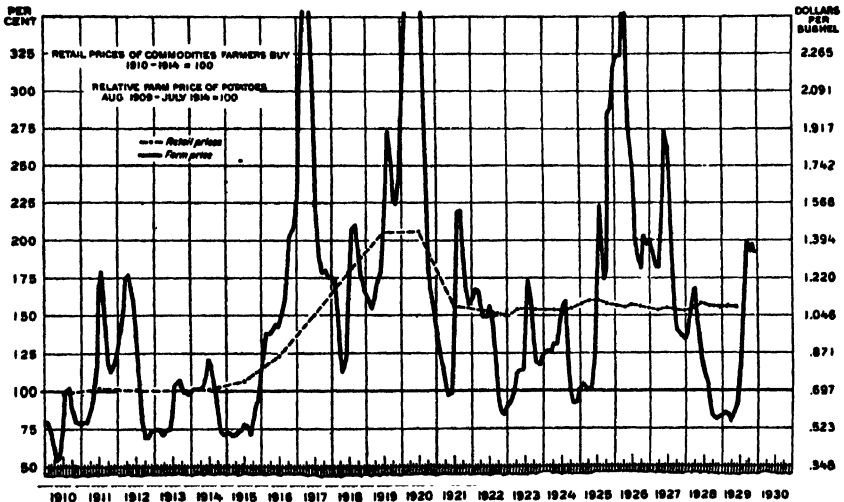


FIGURE 4.—FARM PRICES OF POTATOES AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Potato prices are influenced very largely by variations in the size of the crop in the United States. The high prices of 1911, 1916, 1919, and 1925 accompanied the very small crops of those seasons, and low prices of the 1912, 1914, 1922, 1924, and 1926 seasons accompanied the very large crops in those years. In seasons with very small crops there appears to be a tendency for marked advances after December but no material advance in seasons of very large crops.

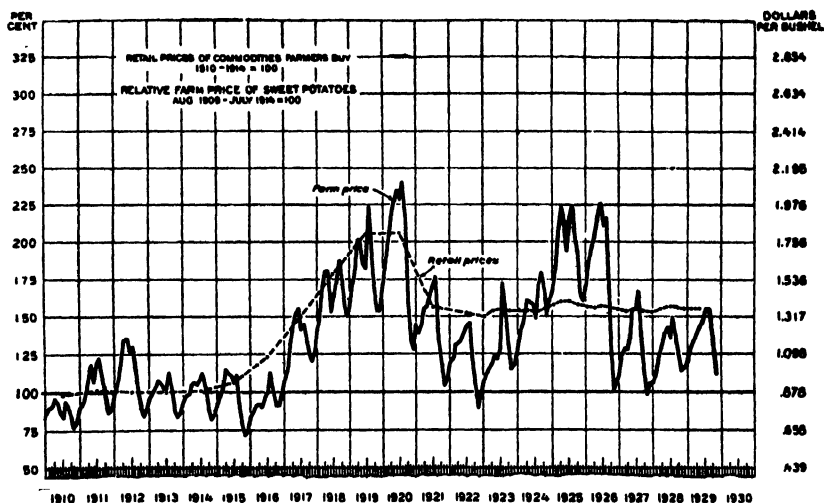


FIGURE 5.—FARM PRICES OF SWEETPOTATOES AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Sweetpotato prices are influenced from year to year very largely by the size of the crop and also by the supply of white potatoes*. Sweetpotato prices usually decline from the high point of the season about July to a low point in November or December and in advance thereafter. War inflation and postwar deflation affected sweetpotato prices. High prices of 1925 and 1926 were due to unusually short crops in 1924 and 1925.

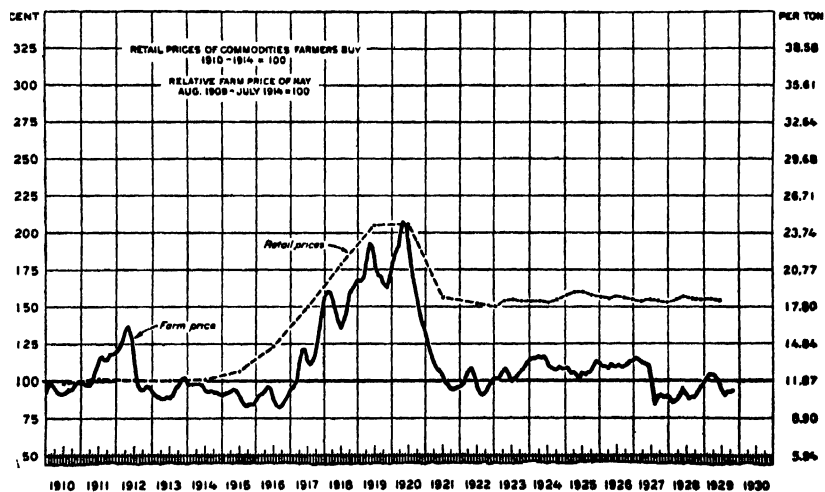


FIGURE 6.—FARM PRICES OF HAY AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

The prices of hay have been practically at pre-war levels since 1921, largely because of the decline in the number of horses in the United States in recent years. From year to year the price of hay is influenced largely by the variations in the size of the crop and by the supply of other feeds. In most seasons there is a definite tendency for hay prices in the winter and spring months to average higher than in the late summer months of abundant hay supplies.

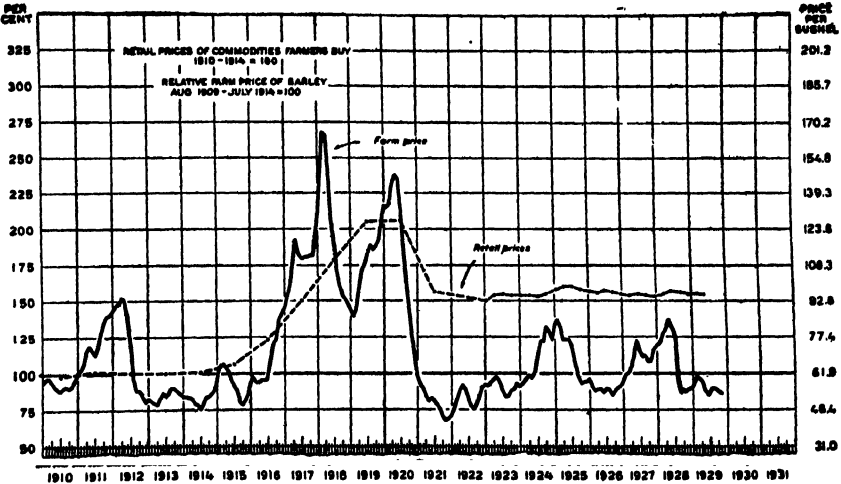


FIGURE 7.—FARM PRICES OF BARLEY AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Farm prices of barley rose during the war but since then have fallen to the pre-war level while retail prices of things farmers buy have averaged about half again as high since 1921 as they were before the war

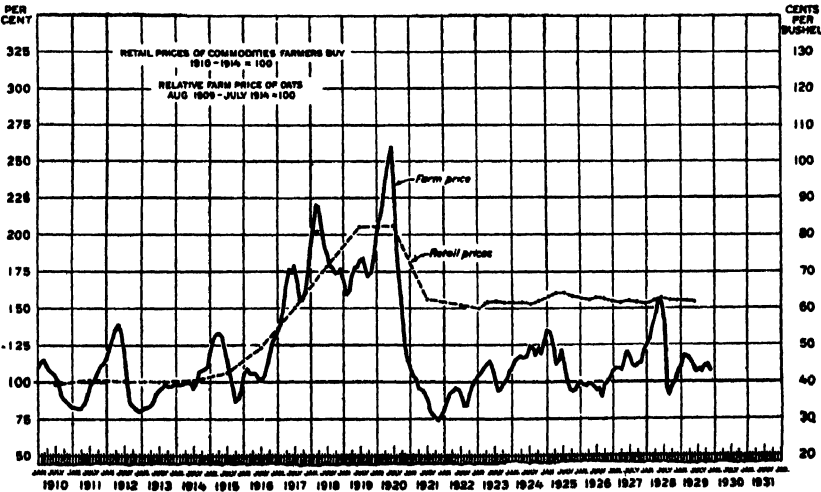


FIGURE 8.—FARM PRICES OF OATS AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

The farm price of oats rose during the war about as much as retail prices, but since 1920 oats prices have averaged but little above the pre-war levels while prices of things farmers buy have been about half again as high as before the war. Year-to-year variations in oats prices are dependent largely upon the size of the crops of oats and other feed grains

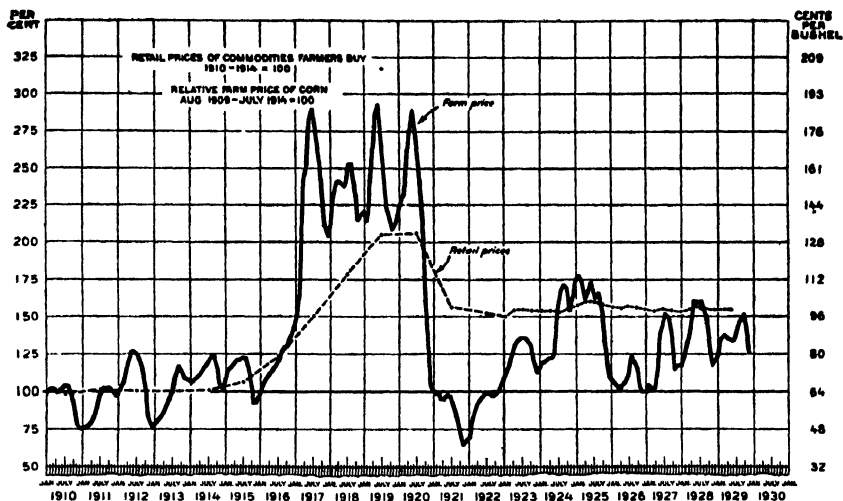


FIGURE 9.—FARM PRICES OF CORN AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Farm prices of corn rose more during the war, but they fell much more in 1920 and 1921 and even during the past few years have not averaged as high as the prices of things farmers buy. Year-to-year variations are mostly due to differences in the size of the crop and to changes in the feeding demand.

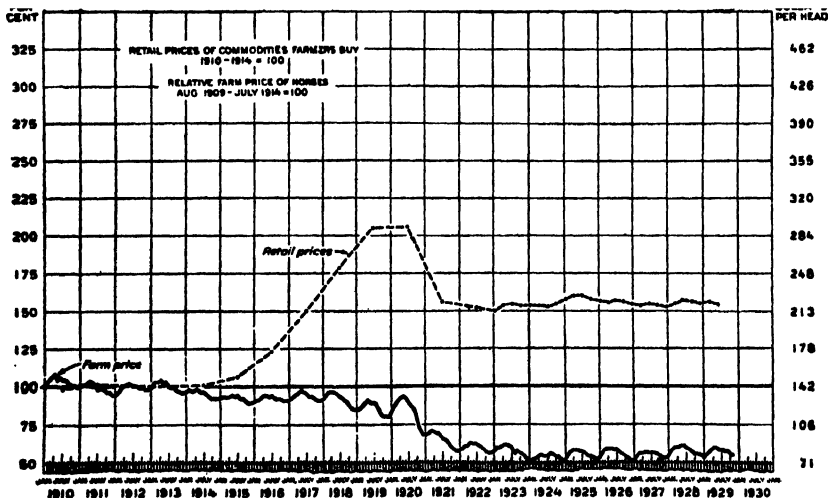


FIGURE 10.—FARM PRICES OF HORSES AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

The price of horses is practically the only one among agricultural prices which failed to show the general commodity advances in the war years of 1917-1919. They declined as did all other prices in 1921 and have since remained on a fairly stable but low level. The downward trend in horse prices in recent years is due largely to the decreased demand brought about by the increased use of trucks and tractors and other farm machinery.

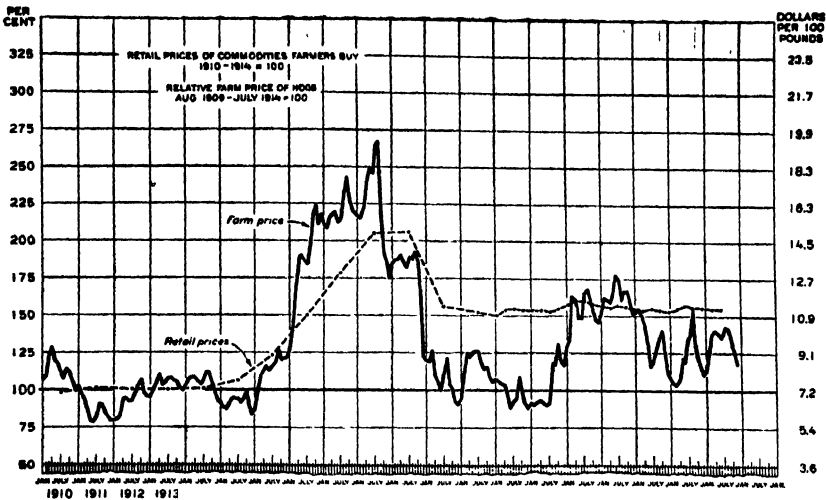


FIGURE 11.—FARM PRICES OF HOGS AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Hog prices vary greatly from year to year. Periods of low prices are followed by periods of high prices, to be followed again by low prices. These swings in prices were increased by war inflation and postwar deflation. In the war period prices were considerably above the level of prices paid by farmers for what they buy, fell far below after the war, and recovered to that level only in the years 1925 and 1926

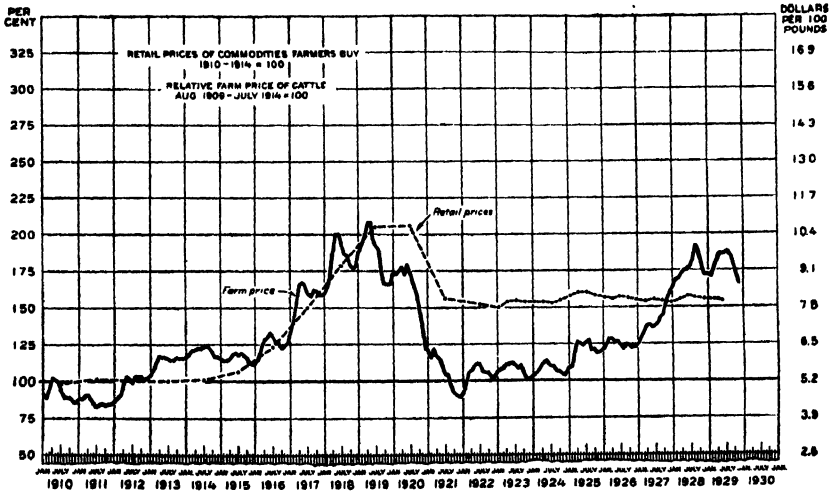


FIGURE 12.—FARM PRICES OF CATTLE AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Cattle prices do not fluctuate as much as hog prices. Beginning in 1913, cattle prices rose more rapidly than the prices of what the farmer buys but fell much more rapidly during the period 1919-1921. This rise and fall, as we shall see later, was due both to inflation and deflation of prices in general and also to changes in production. The upward trend from 1921 to 1928 was due largely to reductions in quantities available for market and improvement in demand for dairy products

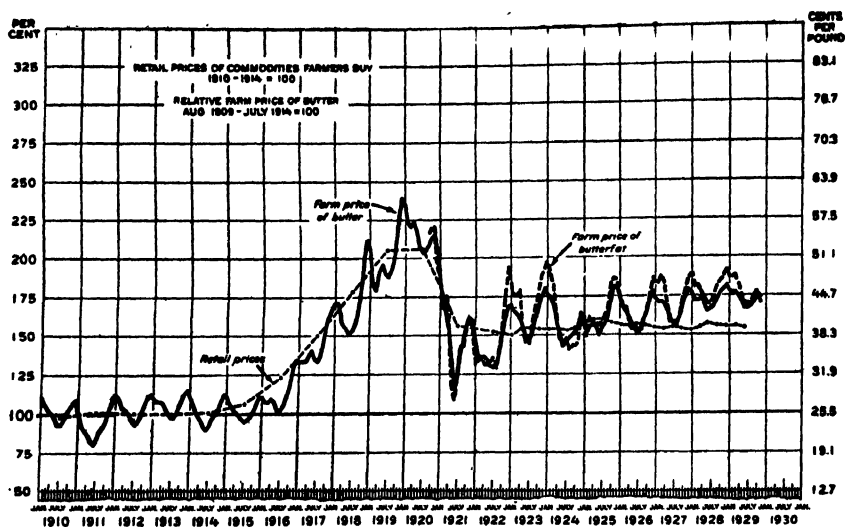


FIGURE 13.—FARM PRICES OF BUTTER AND BUTTERFAT AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Since 1921 the farm price of butter and butterfat have both risen relative to the index of retail prices of commodities which farmers buy. Farm prices of butterfat show a wider seasonal fluctuation than farm prices of butter

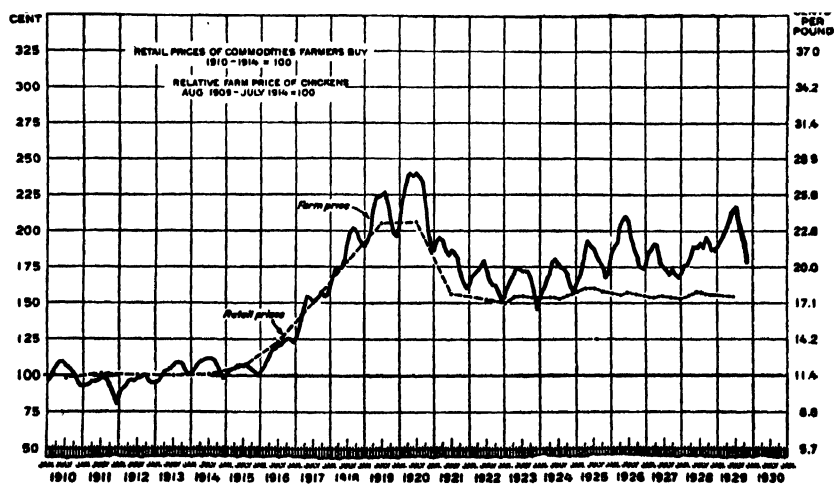


FIGURE 14.—FARM PRICES OF CHICKENS AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

During the past 20 years the farm price of chickens has gradually risen above the index of retail prices of commodities farmers buy, the largest part of this rise occurring since 1923. Compared with the prices the farmer has paid for the goods he buys, the prices he has received during the last five years are higher than at any other time in his period

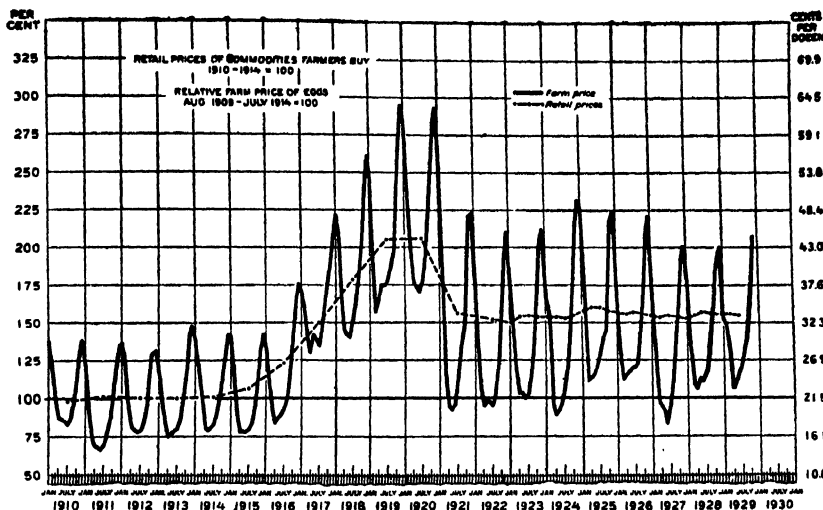


FIGURE 15.—FARM PRICES OF EGGS AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

The farm price of eggs varies widely with the season. Since 1910 there has been little change in the annual average price when compared with the index of retail prices of commodities farmers buy. Due to the greater seasonal changes in the last 10 years, however, the peak fall and winter price has been higher than before when compared with this index and the low spring price has been lower. Most of the farmer's eggs are marketed during this low price season

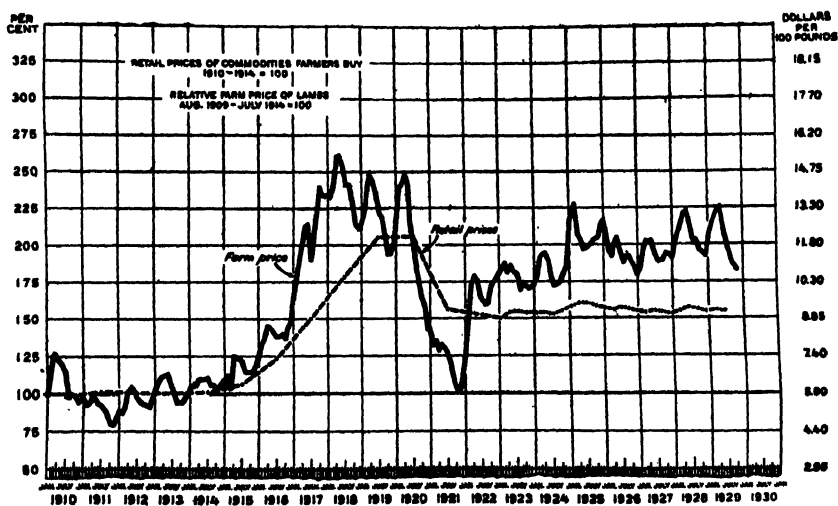


FIGURE 16.—FARM PRICES OF LAMBS AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Lamb prices rose higher and fell lower during the war than prices of commodities farmers buy. Since 1922 lamb prices have been higher than the prices of these commodities as compared to their relationship before the war

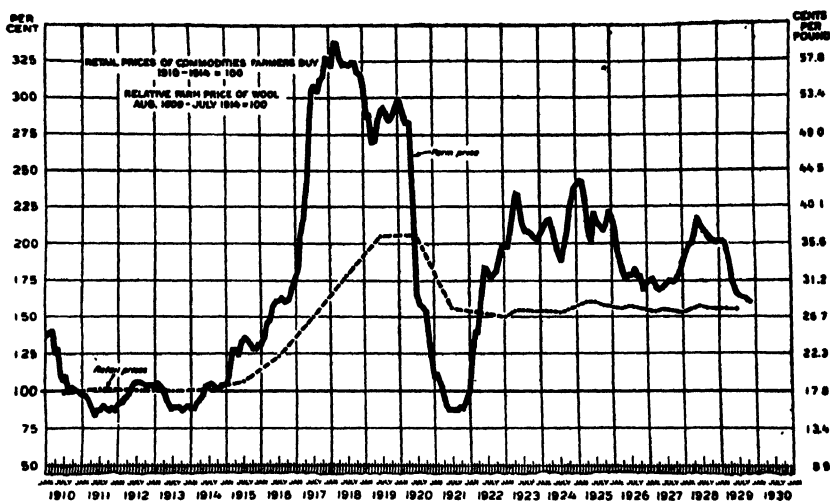


FIGURE 17.—FARM PRICES OF WOOL AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Between 1910 and 1915 world sheep numbers reached a high level and wool prices were low. Smaller supplies, a rising all-commodity price level, and the war demand resulted in high wool prices between 1915 and 1920. The low prices of 1921 were followed by a sharp decline in world wool production and a recovery in wool prices. Since 1924 world sheep numbers have been increasing and wool prices have again had a downward trend.

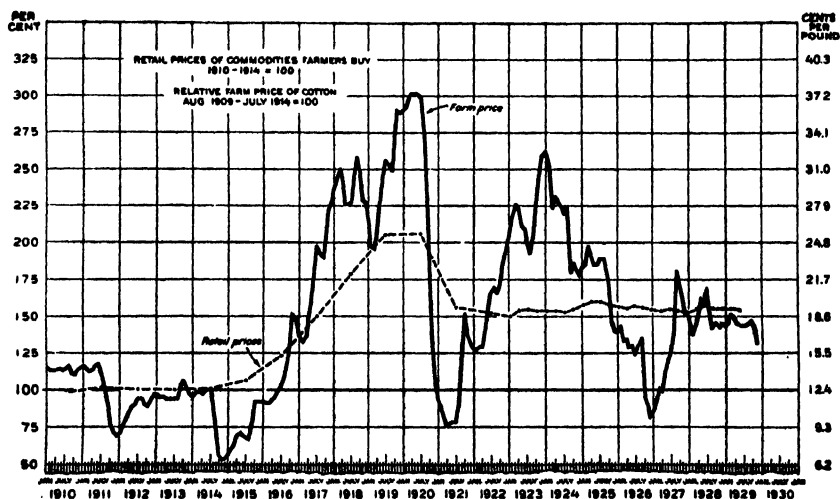


FIGURE 18.—FARM PRICES OF COTTON AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Large cotton crops in 1911 and 1914 reduced the purchasing power of cotton in those years. Small crops and strong domestic demand caused the purchasing power to improve quite steadily from 1914 to 1920. The large supplies of cotton and world-wide depression caused prices to fall rapidly in late 1920 and 1921. The very short crops of 1921, 1922, and 1923, together with improving world-demand conditions, resulted in a very rapid rise, and purchasing power reached the highest levels since the Civil War. These high prices were followed by increased production until checked by the record crop and low prices of 1926.

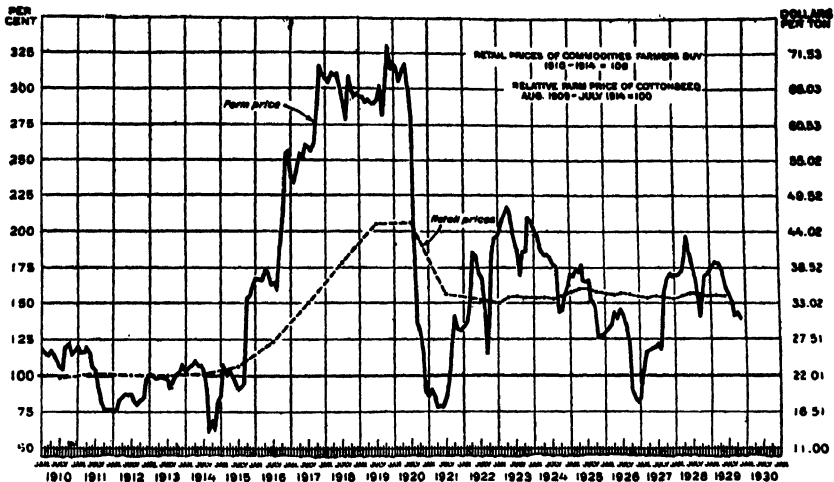


FIGURE 19.—FARM PRICES OF COTTONSEED AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Cottonseed prices have many of the characteristics of cotton-lint prices. The carry-over from year to year is of comparatively less importance in cottonseed, however, so that its price is more closely associated with the size of the cotton crop for each individual year. Also, cottonseed and its products are less dependent upon foreign markets and its prices are affected by the demand for seed and oil

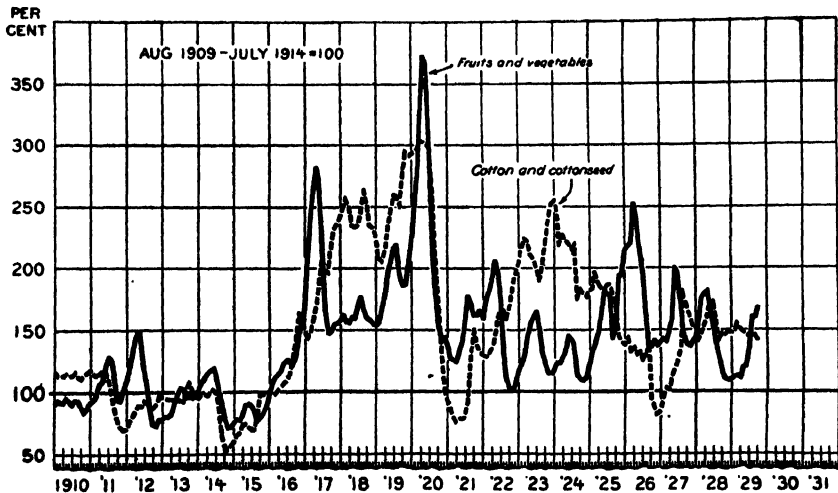


FIGURE 20.—RELATIVE FARM PRICES OF FRUITS AND VEGETABLES AND COTTON AND COTTONSEED, JANUARY, 1910, TO DATE

In this figure the price variations of cotton and cottonseed (shown in figs. 18 and 19) have been combined into one series of relative farm prices, the prices of the 1909-1913 crops being taken as 100 per cent. Similarly the prices of apples, potatoes (see figs. 3 and 4), and several other items, such as sweetpotatoes, beans, oranges, and grapefruit, have been combined into one series of relative farm prices. Potato and apple prices are the most important ones in this group

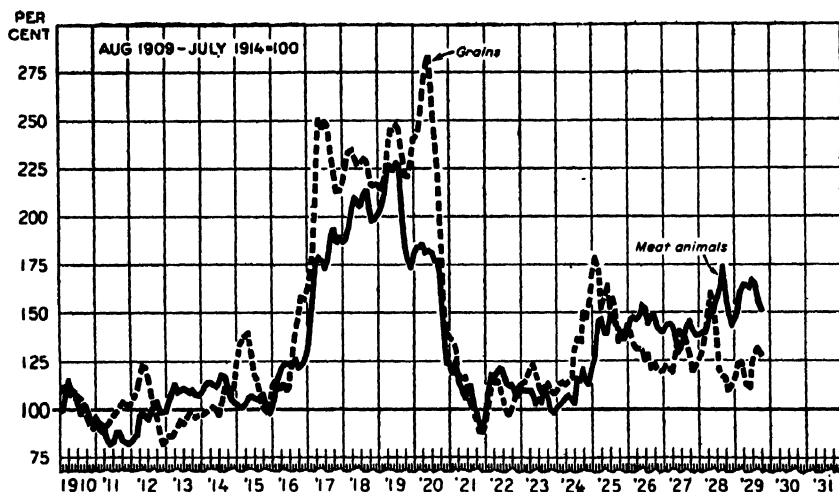


FIGURE 21.—RELATIVE FARM PRICES OF MEAT ANIMALS AND GRAINS, JANUARY, 1910, TO DATE

Prices of grains rose higher during the war period than the prices of meat animals. The prices of these two groups of commodities tend to follow the same general level, but since the middle of 1928 prices of meat animals have been higher than the prices of grains as compared to pre-war relationship

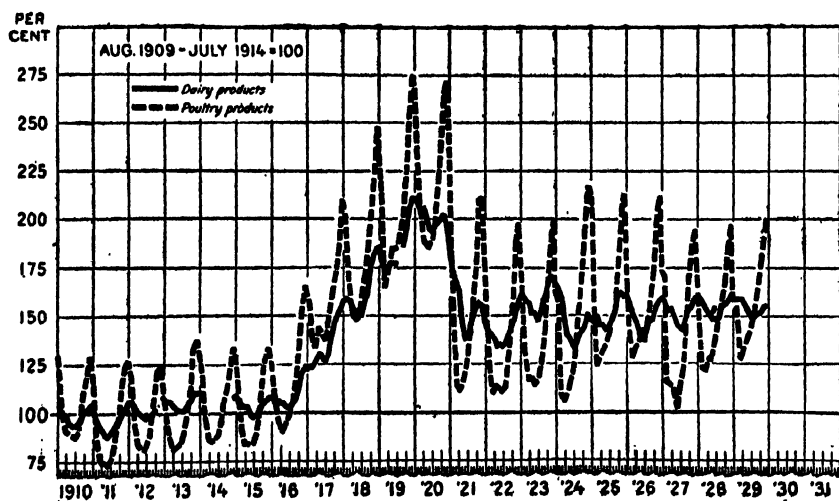


FIGURE 22.—RELATIVE FARM PRICES OF DAIRY AND POULTRY PRODUCTS, JANUARY, 1910, TO DATE

The farm prices of dairy and poultry products have remained in about the same relation to each other since 1910 except during the period 1916-1920, when prices of poultry products rose more than did those of dairy products. The seasonal variation in poultry prices is much greater than in dairy prices

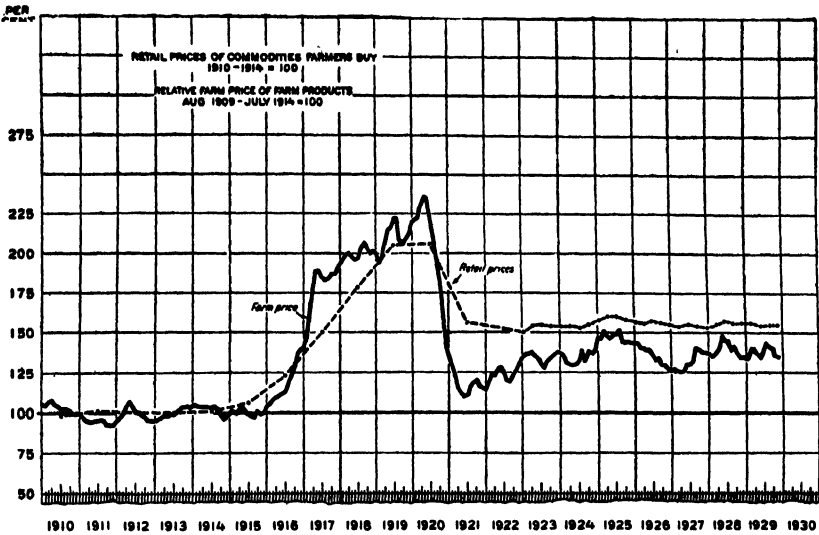


FIGURE 23.—FARM PRICES OF FARM PRODUCTS AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

The index number of farm prices includes an average of the prices of 30 commodities through 1925, and since then 27 commodities. In the period 1917-1920 farm prices rose more than the prices farmers pay but in 1920 and 1921 fell much farther. Since 1921 the trend of prices of farm products has been upward, with retail prices remaining about on the same level, thereby increasing the purchasing power per unit of farm products

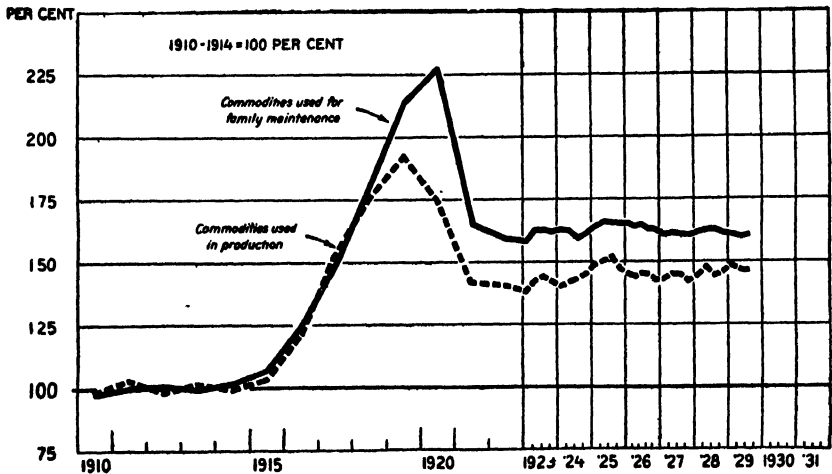


FIGURE 24.—INDEX NUMBERS OF RETAIL PRICES OF COMMODITIES FARMERS BUY

The commodities used in production include seed, feed, machinery, fertilizer, and building materials. The commodities used in family maintenance include food, clothing, furniture, and furnishings, building materials, and operating expenses for the house. It is of interest to note that since 1919 the prices of commodities used in production have been lower relatively than the prices of commodities for the family living. This is largely due to the continuation of high prices for clothing, furniture, and furnishings

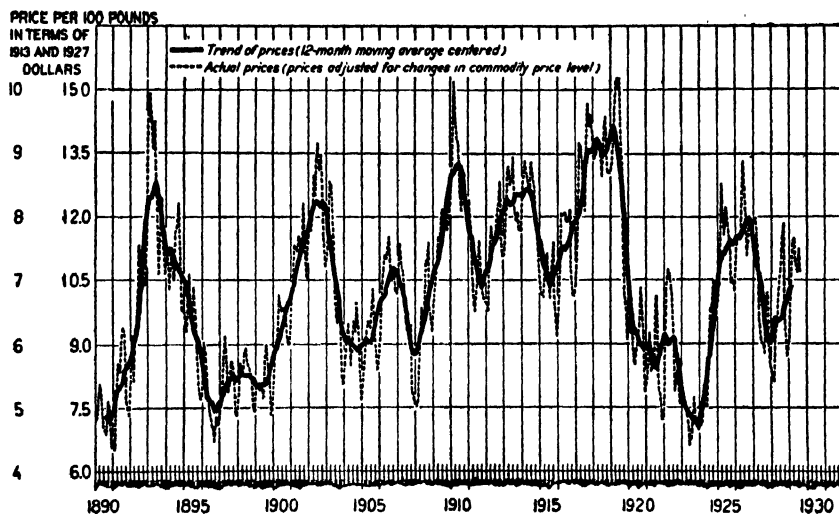


FIGURE 25.—PRICES OF HEAVY HOGS AT CHICAGO, 1890-1929

Since 1890 hog prices, adjusted for changes in the general price level, have moved in cycles varying in length from three to six years. During these years there has been a tendency for every other cycle to be a large one and for the intermediate cycle to be less marked. These cycles are caused by changes in production. When corn prices are low and hog prices high, farmers plan to produce too many hogs, and prices soon drop to lower levels. Then production is reduced and prices rise

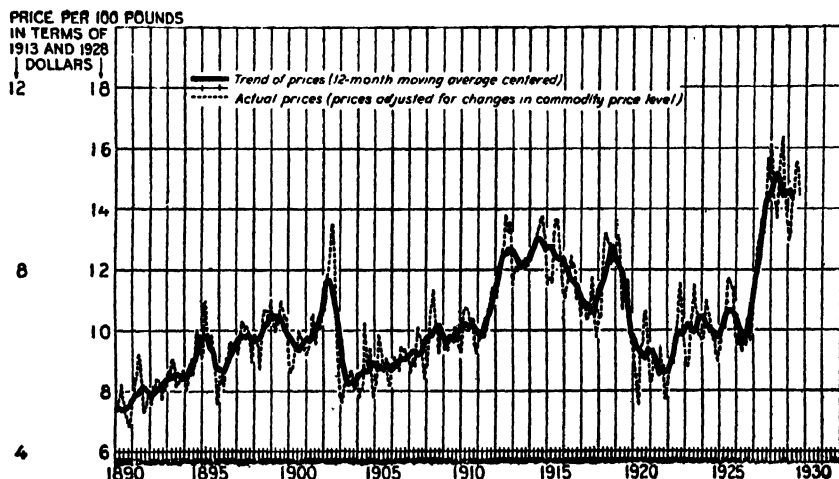


FIGURE 26.—PRICES OF BEEF STEERS AT CHICAGO, 1890-1929

The beef-cattle cycle is longer than the hog cycle. This figure shows only one complete cycle, 1893-1920. The beef-cattle cycle is usually about 16 years in length. Prices are now near the peak of a cycle. Production is beginning to increase and prices will decline. An upward trend in prices from 1890 to date suggests that prices may not fall to a level so low as in 1890, 1908, or 1920

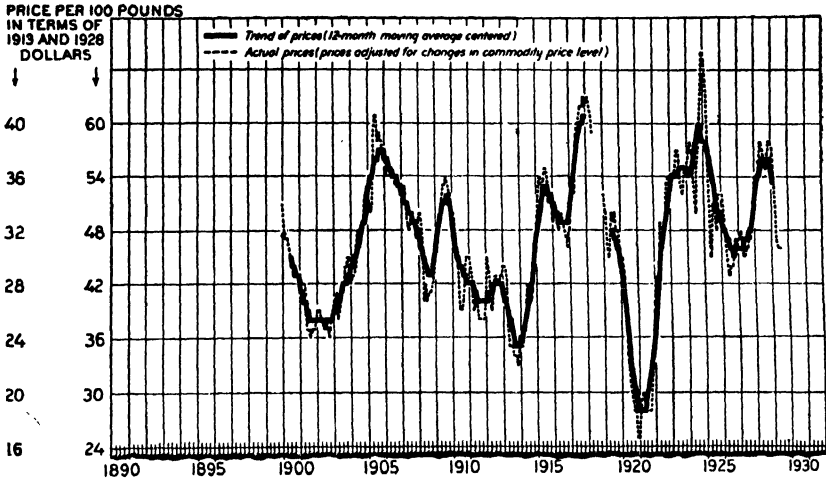


FIGURE 27.—PRICES OF WOOL AT BOSTON, 1900-1929

When domestic wool prices are adjusted for changes in the all-commodity price level, their relationship to the cycle of world sheep numbers is clear. These cycles last for several years. Shorter variations lasting for a year or so are due to the effect of climatic conditions on sheep losses and fleece yields and to demand conditions

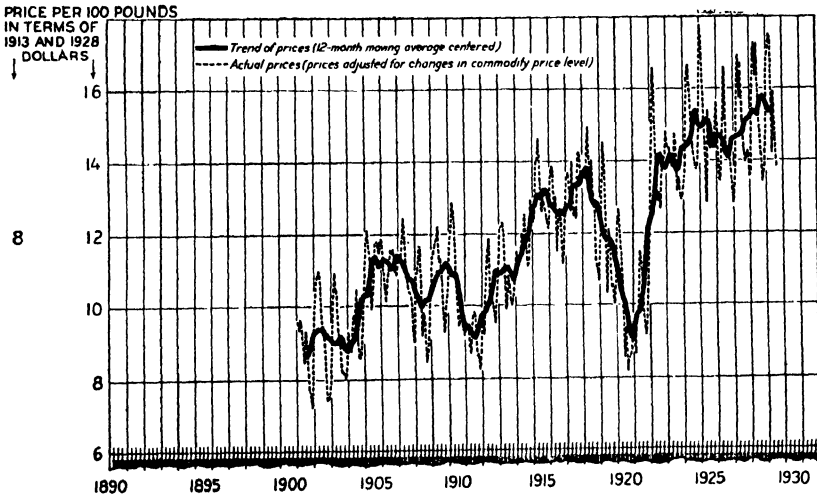


FIGURE 28.—PRICES OF LAMBS AT CHICAGO, 1901-1929

Lamb prices adjusted for changes in the general price level tend to move in cycles. The first cycle shown here extended over a period of eight years and the second one over a period of nine years. The length of the present cycle apparently has been extended by prices remaining at a high level since 1922. This may be attributed to an increase in the demand for lamb and mutton during these years

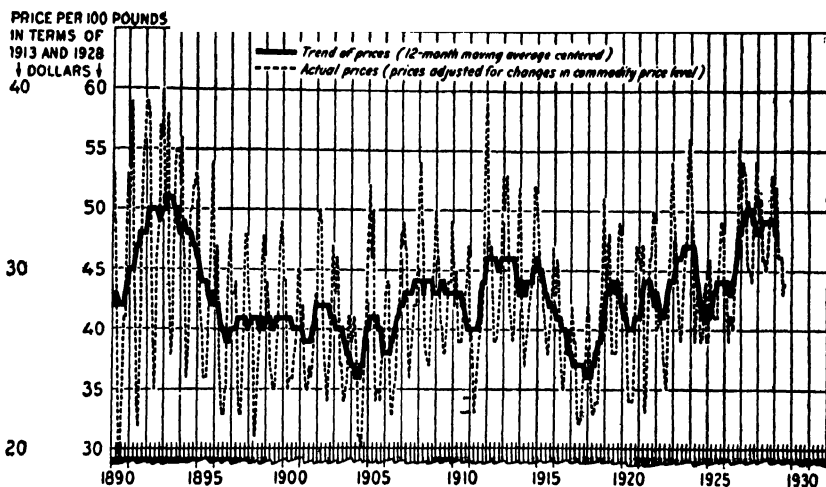


FIGURE 29.—PRICES OF BUTTER AT NEW YORK, 1890-1929

The 12-month moving average of the prices of 92-score butter at New York, adjusted for changes in the commodity price level, shows alternate periods of high and low prices. High points occurred in 1893, 1912, and 1927. Low points were reached in 1904 and 1917. In addition to these long fluctuations of prices there have been shorter swings of about seven years between the low points

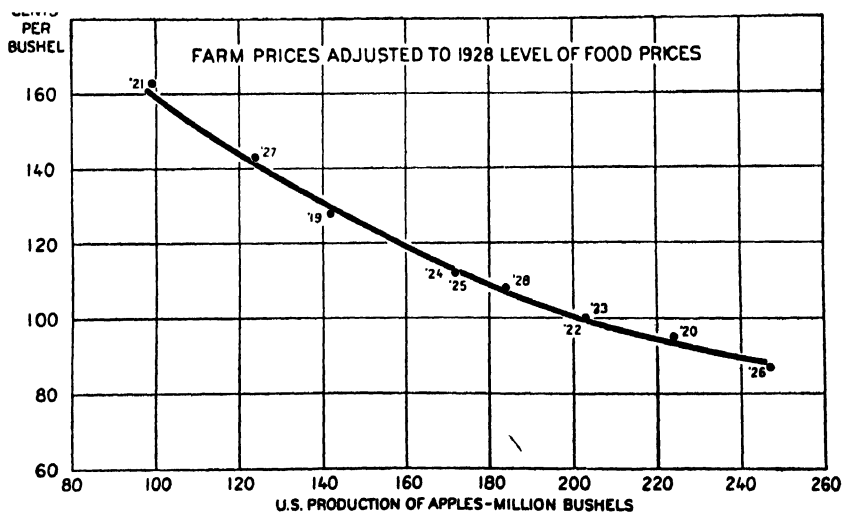


FIGURE 30.—APPLES: RELATION BETWEEN TOTAL PRODUCTION AND UNITED STATES FARM PRICE, 1919-1928

The most important single factor in the yearly variations in the price of apples received by growers is the variation in the size of the crop throughout the United States. In the 10 years 1919-1928 the relation between production and price has been such that a crop of around 100 million bushels brought an average price of about \$1.60 per bushel, while a crop of 200 million bushels brought an average price of about \$1, indicating that the value of the larger crop (about \$200,000,000) was greater than the value of the smaller crop (\$160,000,000)

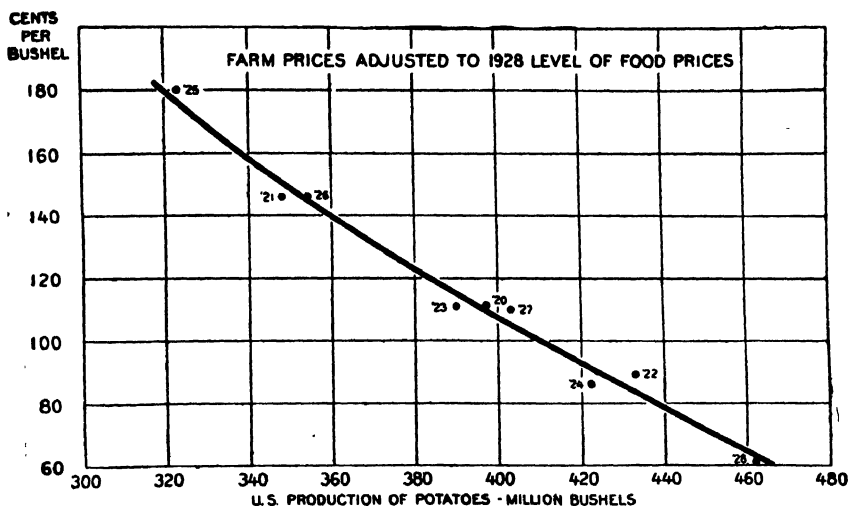


FIGURE 31.—POTATOES: RELATION BETWEEN TOTAL PRODUCTION AND UNITED STATES FARM PRICE, 1920-1928

The most important single factor in the yearly variations in the farm price of potatoes in the past 9 years has been the variation in the size of the crop in the United States. The relation between production and price has been such that a small crop of around 320 million bushels brought a price of around \$1.80 per bushel, while a large crop of 440 million bushels brought a price of around 80 cents, indicating that the value of the large crop (valued at \$352,000,000) was considerably smaller than that of the smaller crop (valued at \$576,000,000)

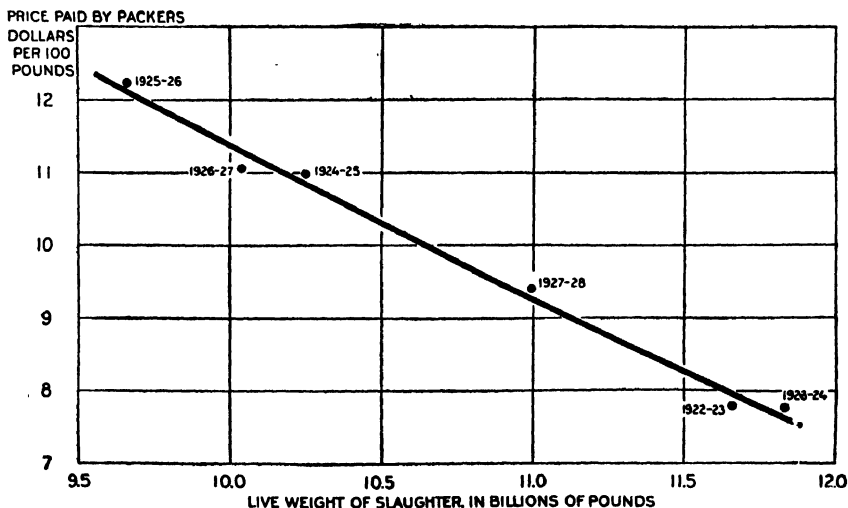


FIGURE 32.—HOGS: RELATION BETWEEN PRICE AND TOTAL LIVE WEIGHT OF SLAUGHTER UNDER FEDERAL INSPECTION, 1922-23 TO 1927-28. PRICES FOR YEAR FROM NOVEMBER THROUGH OCTOBER ADJUSTED TO 1928 PRICE LEVELS

The greater the total live weight of hogs slaughtered during the marketing years from 1922-23 to 1927-28 the less the price per hundred pounds paid by packers. Also, the greater the total live weight of hogs slaughtered the less their total value. On the 1928 price level, 10 billion pounds would sell for about 11.3 cents per pound, but 11 billion pounds would bring only about 9.3 cents per pound

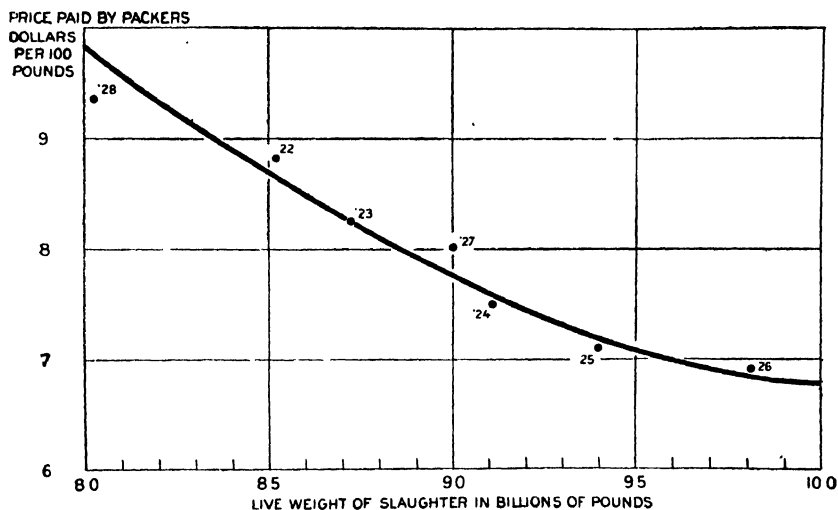


FIGURE 33.—BEEF CATTLE: RELATION BETWEEN PRICE AND TOTAL LIVE WEIGHT OF SLAUGHTER UNDER FEDERAL INSPECTION, 1922-1928. PRICES FOR CALENDAR YEAR ADJUSTED FOR TREND AND 1928 PRICE LEVEL

After removing the influence of what appears to have been a fairly regular increase in demand during the period 1922-1928, the above relationship exists between total live weight of cattle slaughtered and price per hundred pounds paid by packers, with a level of demand approximately that existing in 1925

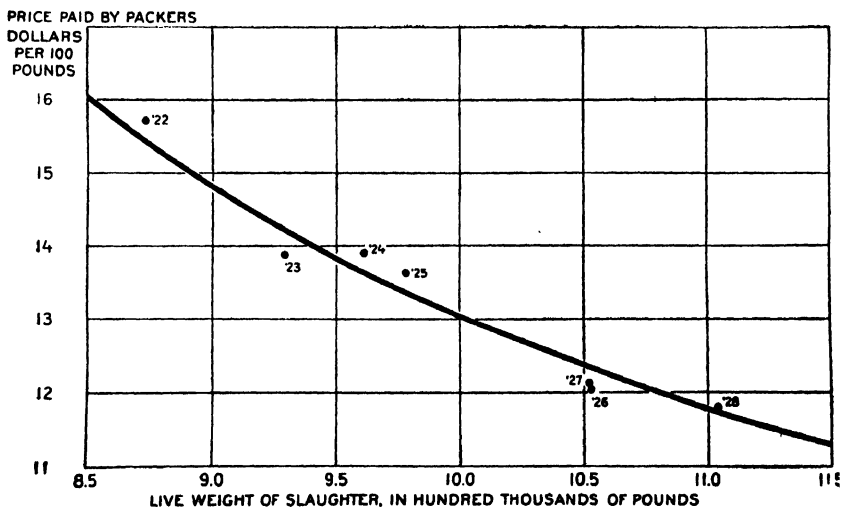


FIGURE 34.—SHEEP: RELATION BETWEEN PRICE AND TOTAL LIVE WEIGHT OF SLAUGHTER UNDER FEDERAL INSPECTION, 1922-1928. PRICES FOR CALENDAR YEAR ADJUSTED FOR TREND AND 1928 PRICE LEVEL

After removing the influence of an apparent increase in demand, a fairly close relationship exists between total live weight of sheep slaughtered and price paid by packers during the years 1922 to 1928. In the construction of this curve demand is held constant at a level approximately the average of that existing in 1924 and 1925

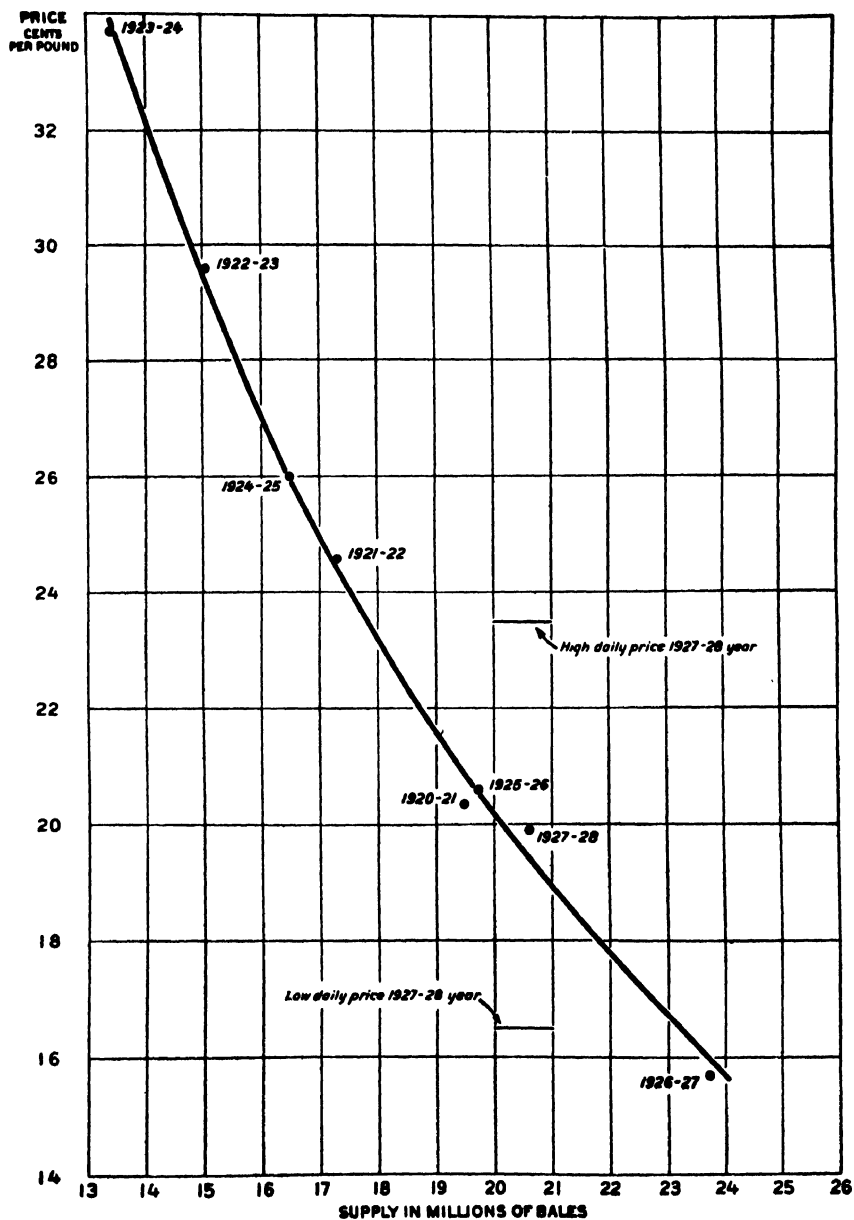


FIGURE 35.—AVERAGE RELATIONSHIP BETWEEN WORLD SUPPLIES OF AMERICAN COTTON AND NEW ORLEANS YEARLY PRICE ADJUSTED TO 1927-28 TREND AND PRICE LEVEL.

The level of cotton prices each season is determined in large part by the total supply of American cotton, as shown by the accompanying figure giving seasonal supplies and average prices adjusted to the all-commodity price level and to the demand conditions of 1927-28. That prices fluctuate widely from this level is shown by the distance between the lines indicating the high and low prices for the 1927-28 season.

AGRICULTURE STATISTICS

UNITED STATES DEPARTMENT OF AGRICULTURE YEARBOOK, 1930

Prepared under the direction of the Statistical Committee: O. C. Stine, chairman, Lewis B. Flohr, secretary, J. A. Becker, S. W. Mendum, C. A. Burmeister, and L. M. Davis.

INTRODUCTION

The statistical section of this Yearbook brings together in one place what seems from experience to be the most important agricultural statistics for the United States, and for the world so far as the agriculture of this country is concerned. Historical and geographical series have been given as far as material permitted. These are basic data helpful to the producer in his problems of production and marketing of agricultural commodities.

For greater detail on individual commodities than can be shown in the Yearbook, Statistical Bulletin series of the department may be consulted.

For current statistics to supplement the Yearbook statistics the following sources should be used: (1) Crops and Markets—a monthly publication of the department carrying the latest current statistics available on agriculture in the United States; (2) Foreign Crops and Markets—issued weekly by the Bureau of Agricultural Economics and devoted to current world statistics of crops, livestock, and markets; (3) Foreign Commodity News—published by the Bureau of Agricultural Economics and showing the latest world information on single commodities and released as important information is received; (4) market news reports of the Bureau of Agricultural Economics—issued daily, weekly, monthly, quarterly, or at irregular intervals, at Washington and the principal markets.

Statistical data from the following bureaus are included: Weather Bureau, Bureau of Animal Industry, Forest Service, Bureau of Public Roads, Bureau of Agricultural Economics, Bureau of Dairy Industry, Extension Service, and Grain Futures Administration.

The Federal market news system supplies much price and market information presented here. The leased-wire system in use by the service extends from the Atlantic to the Pacific and reaches most of the important markets of the country. At each of the branch offices commodity specialists gather information regarding the supply, the demand, and prices for the products on which they report. They observe the sales actually made on the markets and are constantly in touch with the traders who in many instances give them access to their office records in order that they may have specific information on which to base their reports.

The fruits and vegetables market news service covers car-lot shipments, car-lot unloads, and prices. Car-lot shipments are reported by officials and agents of railroads, express companies, and boat lines. Car-lot unloads information is obtained by representatives of the bureau in the larger markets of the country from railroad, express company, and boat-line officials.

The dairy and poultry service obtains the statistics of receipts from reports by the railroads and by receivers of truck receipts made daily direct to the Bureau of Agricultural Economics, through its local offices in the cities concerned. Current storage stocks of dairy and poultry products are obtained directly by telegraph from all important storage warehouses. Prices reported at terminal markets are obtained by personal interview of employees of the bureau with buyers and sellers, and represent the majority of sales reported.

The market news service on livestock, meats, and wool receives statistics of receipts, slaughter, and shipment of livestock from monthly reports submitted by the public stockyards. Its price reports are based on information gathered by bureau reporters in the large markets who observe trade conditions, discuss the market with buyers and sellers, and on the basis of all information they gather quote a daily range of prices for individual grades or groups of grades.

The grain, hay, feed, and seed market news reports are based on current information from reporters in the leading markets.

The statistics of grain grading are based on work done by licensed grain inspectors located throughout the United States.

The crop and livestock reporting service estimates acreage, condition of crop, yield per acre, production, and prices of crops, and numbers, prices, and values of livestock. The organization of this work outside of the crop-reporting board and the office force in Washington consists of 41 State field officers, with an agricultural statistician in charge. There is one field office for the New England States, one for Maryland and Delaware, and one for Utah and Nevada. There is a dual system of agricultural correspondents and reporters distributed over the country. One group sends its reports to the local State field office and the other group directly to the Bureau in Washington.

Acreages for the year 1909 are as reported by the Bureau of the Census; acreages in 1919 and 1924 are based upon the census (preliminary for 1924 in some States), supplemented by State enumerations. In the intercensal years, from 1911 to 1915, estimated acreages were obtained by applying estimated percentages of decrease or increase to the published acreage in the preceding year. The estimates from 1915 to 1918, from 1919 to 1923, and from 1925 to 1929 are based upon acreage changes from year to year as shown by a sample of approximately 2 per cent of the crop acreages in each year, supplemented by State enumerations. Yields per acre are estimates based upon reports of one or more farmers in each agricultural township on the average yield per acre in their localities. Production is acreage times yield per acre.

Estimates of farm stocks, shipments, quality, crop condition, and miscellaneous information concerning crops are based either upon sample data or upon estimates of crop reporters for their localities. The sources of these data are indicated in the notes accompanying the tables.

Monthly estimated prices received by producers on the specified dates are based upon reports from special price reporters, who are mostly country dealers, on the average price paid to farmers and do not relate to any specified grade.

Farm value as shown is computed by applying the December 1 farm price to the total production. (The prices are reported by the crop reporters, who are mostly farmers.) The average price received for the portion of the crop sold may be greater or less than this price, depending upon the prices previous and subsequent to December 1 and the amount of the crop sold at the different prices.

Numbers of livestock on farms on January 1, 1920 and 1925, are based upon the census enumeration as of that date, supplemented by enumerations by State agencies, such as assessors and brand inspection boards, and by records of shipments during 1920 and 1925. In the intercensal years, from 1911 to 1916, the numbers of livestock were obtained by methods identical with those used for crop acreages. Estimates from 1917 to 1919, from 1920 to 1923, and from 1926 to 1929 are based upon a sample of approximately 2 per cent, supplemented by trends derived from assessors' enumerations, reports of brand inspection boards, market movements, and stockyard receipts. The census bases are not always comparable from one decade to another, because of changes of dates and classifications.

The average value per head on January 1 is estimated from reports of correspondents relating to livestock in their vicinity. These tend to reflect inventory values as distinguished from the monthly prices which relate to sales. The farm value on January 1 is computed by applying the average value per head to the number of head on farms.

Where a weighting factor was available market prices as shown are weighted averages, but in many cases a weighting factor was not available, and the prices shown are usually the means of ranges of quotations without reference to quantity. The weighted price of wheat in Chicago is based on the number of carload sales reported, which range from 42 to 55 per cent of all receipts on that market. The weighted average price of hogs at Chicago is based on total sales of butcher and packer hogs to slaughterers.

Prices derived from different sources may not be strictly comparable, although for most general purposes they are satisfactory. The changes in the grade and weight groupings of many kinds of livestock which were made July 1, 1925, while not affecting certain price series, made others only fairly comparable and made comparison impossible in other cases. The data as to commercial stocks and movements of various commodities are as nearly complete as practicable and feasible, and are considered fairly representative.

Statistics of acreage and production in foreign countries are compiled as far as possible from official sources and are therefore subject to whatever errors may result from shortcomings in the reporting and statistical services of the various countries. Inaccuracies also result from differences in nomenclature and classification in foreign countries. Except where otherwise stated, pre-war data refer to

pre-war boundaries. Yields per acre are calculated from acreage and production, both rounded to thousand units, and are therefore subject to a greater possibility of error when calculated for countries with small acreage.

The tables of international trade cover substantially the international trade of the world. The total imports and the total exports in any one year can not be expected to balance, although disagreements tend to be compensated over a series of years. Among the sources of disagreement are: The different periods covered by the "year" of various countries; imports received in the year subsequent to the year of export; lack of uniformity in classification of goods as among countries; different trade practices and varying degrees of failure in recording countries of origin and ultimate destination; different practices in recording reexported goods; and different methods of treating free ports. The exports given are domestic exports and the imports given are imports for consumption, whenever it is possible to distinguish such imports from general imports. While there are some inevitable omissions, there may be some duplication because of reshipments which do not appear as such in the official reports. In the trade tables, figures for the United States include Alaska, Porto Rico, and Hawaii, but not the Philippine Islands.

As an aid to the comprehension and use of these statistics, the following table of weights, measures, and conversion factors will be useful:

Weights, measures, and conversion factors used in the Department of Agriculture

| Commodity | Unit ¹ | Weight in pounds | Commodity | Unit ¹ | Weight in pounds |
|-------------------|-------------------|--------------------------------------|------------------|-------------------|------------------|
| Alfalfa seed | Bushel | 60 | Lemons | Box | 74 |
| Almonds | Short ton | 2,000 | Milk | Gallon | 8.6 |
| Apricots | do | 2,000 | Oats | Bushel | 32 |
| Do | Bushel | 48 | Oranges (Calif.) | Box | 70 |
| Asparagus | Short ton | 2,000 | Oranges (Fla.) | do | 80 |
| Barley | Bushel | 48 | Orchard grass | Bushel | 14 |
| Beans, snap | Short ton | 2,000 | Peanut oil | Gallon | 7.5 |
| Beans, dry | Bushel | 60 | Plums | Short ton | 2,000 |
| Beet sugar | Short ton | 2,000 | Potatoes | Bushel | 60 |
| Broomcorn | do | 2,000 | Prunes | Short ton | 2,000 |
| Buckwheat | Bushel | 48 | Rapeseed | Bushel | 50 |
| Cabbage | Short ton | 2,000 | Raisins | Short ton | 2,000 |
| Cane sugar | do | 2,000 | Rice, rough | Bushel | 45 |
| Clover seed | Bushel | 60 | Rice, cleaned | do | 60 |
| Corn, shelled | do | 56 | Rye | do | 56 |
| Corn, ear, husked | do | 70 | Rye flour | Barrel | 196 |
| Cottonseed | Short ton | 2,000 | Soy-bean oil | Gallon | 7.5 |
| Cotton, ginned | Bale | ² 478 ³ 500 | Spelt | Bushel | 40 |
| Cottonseed oil | Gallon | 7.5 | Sugar | Short ton | 2,000 |
| Flaxseed | Bushel | 56 | Sugar beets | do | 2,000 |
| Figs | Short ton | 2,000 | Sugar cane | do | 2,000 |
| Grapefruit | Box | 70 | Timothy seed | Bushel | 45 |
| Grapes | Short ton | 2,000 | Tomatoes | do | 56 |
| Hay | do | 2,000 | Wheat | do | 60 |
| Hemp seed | Bushel | 44 | Wheat flour | Barrel | 196 |
| | | | Walnuts | Short ton | 2,000 |

| Commodity | Equivalents |
|-------------------|---|
| Almonds | 1 pound shelled is equivalent to about 3½ pounds unshelled. |
| Apples | 1 pound dried is equivalent to about 5 pounds of fresh. |
| Barley flour | 1 barrel (196 pounds) is equivalent to about 9 bushels of barley. |
| Buckwheat flour | 1 barrel (196 pounds) is equivalent to about 7 bushels of buckwheat. |
| Filberts | 1 pound shelled is equivalent to about 2.22 pounds unshelled. |
| Malt | 1.1 bushel (34 pounds) is equivalent to about 1 bushel of barley. |
| Oatmeal | 1 barrel (196 pounds) is equivalent to about 10½ bushels of oats. |
| Do | 18 pounds is equivalent to about 1 bushel of oats. |
| Peanuts | 1 pound shelled is equivalent to about 1½ pounds unshelled. |
| Peaches (Calif.) | 1 pound dried is equivalent to about 5½ pounds fresh. |
| Prunes | 1 pound dried is equivalent to about 2½ pounds fresh. |
| Rye flour | 1 barrel (196 pounds) is equivalent to about 6 bushels of rye. |
| Raisins | 1 pound is equivalent to about 4 pounds of grapes. |
| Wheat flour | 1 barrel (196 pounds) is equivalent to about 4.7 bushels of wheat. ⁴ |
| Walnuts (English) | 1 pound shelled is equivalent to about 2.38 pounds unshelled. |

¹Standard bushel used in the United States contains 2,150.42 cubic inches; the gallon, 231 cubic inches.

²Net.

³Gross.

⁴Due to changes in milling processes equivalents have varied as follows: 1790-1879, 5; 1880-1908, 4.75; 1909-1917, 4.7; 1918-1919, 4.5; 1920, 4.6; 1921-1927, 4.7.

STATISTICS OF GRAINS

TABLE 1.—Wheat: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866-1929

| Year | Acreage harvested | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Spring wheat, price per bushel at Chicago, year beginning July 1 ¹ | No. 2 red winter wheat, price per bushel at Chicago, year beginning July 1 ² | Foreign trade, including flour, year beginning July 1 ³ | | | |
|------|-------------------|------------------------|-------------|---|-------------------|---|---|--|----------------------|--------------------------|--------------------------|
| | | | | | | | | Domestic exports ⁴ | Imports ⁵ | Net exports ⁶ | |
| | | | | | | | | | | Total | Percentage of production |
| | 1,000 acres | Bush. | 1,000 bush. | Cts. | 1,000 dolls. | Cts. | Cts. | 1,000 bush. | 1,000 bush. | 1,000 bush. | Per cent |
| 1849 | | | 100,486 | | | 66 | | 7,536 | 2,913 | 5,701 | 5.7 |
| 1859 | | | 175,105 | | | 90 | 82 | 17,213 | 7,493 | 12,720 | 7.3 |
| 1866 | 15,424 | 9.9 | 152,000 | 152.7 | 232,110 | 219 | 94 | 12,647 | 3,093 | 10,828 | 7.1 |
| 1867 | 18,322 | 11.6 | 212,441 | 145.2 | 308,347 | 198 | 145 | 26,323 | 2,014 | 24,550 | 11.6 |
| 1868 | 18,410 | 12.1 | 224,037 | 108.5 | 243,033 | 134 | 123 | 29,717 | 1,830 | 28,314 | 12.6 |
| 1869 | | | 287,746 | | | | | | | | |
| 1869 | 19,181 | 13.6 | 260,147 | 76.5 | 199,025 | 98 | 84 | 53,901 | 1,286 | 53,126 | 20.4 |
| 1870 | 18,993 | 12.4 | 235,885 | 94.4 | 222,767 | 116 | 84 | 52,574 | 867 | 52,195 | 22.1 |
| 1871 | 19,944 | 11.6 | 230,722 | 114.5 | 264,076 | 124 | 109 | 38,996 | 2,411 | 37,587 | 16.3 |
| 1872 | 20,858 | 12.0 | 249,997 | 111.4 | 278,522 | 121 | 111 | 52,015 | 1,841 | 50,705 | 20.3 |
| 1873 | 22,172 | 12.7 | 281,255 | 106.9 | 300,670 | 116 | 103 | 91,510 | 2,117 | 90,418 | 32.1 |
| 1874 | 24,967 | 12.3 | 308,103 | 86.3 | 265,881 | 95 | 98 | 72,913 | 368 | 72,845 | 23.6 |
| 1875 | 26,382 | 11.1 | 292,136 | 89.5 | 261,397 | 106 | 86 | 74,751 | 1,664 | 74,508 | 25.5 |
| 1876 | 27,627 | 10.5 | 289,356 | 97.0 | 280,743 | 122 | 92 | 57,044 | 366 | 57,148 | 19.8 |
| 1877 | 26,278 | 13.9 | 364,194 | 105.7 | 385,089 | 111 | 121 | 92,142 | 1,391 | 92,028 | 25.3 |
| 1878 | 32,109 | 13.1 | 420,122 | 77.6 | 325,814 | 90 | 95 | 150,503 | 2,074 | 150,253 | 35.8 |
| 1879 | 35,430 | 13.0 | 459,483 | | | | | | | | |
| 1879 | 35,430 | 14.1 | 499,893 | 110.6 | 552,884 | 110 | 99 | 181,807 | 487 | 181,951 | 36.4 |
| 1880 | 37,987 | 13.1 | 498,550 | 95.1 | 474,202 | 100 | 105 | 188,308 | 212 | 188,270 | 37.8 |
| 1881 | 37,709 | 10.2 | 383,280 | 119.2 | 456,880 | 128 | 115 | 123,371 | 867 | 123,211 | 32.1 |
| 1882 | 37,067 | 13.6 | 504,185 | 88.4 | 445,602 | 105 | 118 | 150,113 | 1,088 | 150,000 | 29.8 |
| 1883 | 36,456 | 11.6 | 421,086 | 91.1 | 383,649 | 93 | 102 | 113,822 | 33 | 113,892 | 27.0 |
| 1884 | 39,476 | 13.0 | 512,765 | 64.5 | 330,862 | 79 | 83 | 135,232 | 213 | 135,301 | 26.4 |
| 1885 | 34,189 | 10.4 | 357,112 | 77.1 | 275,320 | 81 | 88 | 96,611 | 389 | 96,509 | 27.0 |
| 1886 | 36,806 | 12.4 | 467,218 | 68.7 | 314,226 | 77 | 76 | 156,685 | 283 | 156,719 | 34.3 |
| 1887 | 37,642 | 12.1 | 456,329 | 68.1 | 310,613 | 75 | 75 | 122,616 | 596 | 122,524 | 26.8 |
| 1888 | 37,336 | 11.1 | 415,868 | 92.6 | 385,248 | 95 | 88 | 90,944 | 136 | 91,030 | 21.9 |
| 1889 | 35,680 | 12.9 | 468,374 | | | | | | | | |
| 1889 | 33,580 | 12.9 | 434,383 | 69.5 | 301,869 | 81 | 86 | 112,488 | 163 | 112,507 | 25.9 |
| 1890 | 34,048 | 11.1 | 378,097 | 83.3 | 315,112 | 97 | 89 | 109,017 | 586 | 109,054 | 28.8 |
| 1891 | 37,826 | 11.5 | 584,504 | 83.4 | 487,463 | 89 | 96 | 229,465 | 2,463 | 228,841 | 39.2 |
| 1892 | 39,552 | 13.3 | 527,987 | 62.2 | 328,331 | 73 | 78 | 196,068 | 968 | 195,672 | 37.1 |
| 1893 | 37,934 | 11.3 | 427,553 | 53.5 | 228,599 | 60 | 68 | 168,498 | 1,183 | 167,531 | 39.2 |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

¹ Spring wheat prices compiled as follows: 1849-1870, from Chicago newspapers, quoted; 1849, spring wheat, contract grade; 1859, standard spring, contract grade; 1866-1870, No. 1 spring, contract grade; 1871-1884, annual reports of Chicago Board of Trade, quoted as No. 2 spring, contract grade; 1885-1896, Bartel's Red Book, quoted as No. 2 spring; January, 1897-June, 1904, Chicago Daily Trade Bulletin, average of daily ranges; quotations used; January-October, 1897, No. 3 spring; November, 1897-June, 1898, No. 3 spring, hard varieties; July, 1898-June, 1904, No. 1 spring; from February, 1897, "free on board" was used when available; July, 1904-December, 1918, Bartel's Red Book, average of daily ranges, quoted as No. 1 northern. Subsequently from the Chicago Daily Trade Bulletin and are averages of the daily cash price per bushel weighted by car-lot sales.

² Prices, 1839-1898, are from the Price Current Grain Reporter 1924 Yearbook, p. 4, and are average cash prices for calendar years; subsequently from the Chicago Daily Trade Bulletin and are averages of the daily cash price per bushel weighted by car-lot sales.

NOTES: VALUE ISSUES, 1849-1850; SEASONAL VALUE ISSUES, 1851-1859; 1860-1869, 1870-1879, 1880-1889, 1890-1899, 1900-1909, 1910-1919, 1920-1929, 1930-1939, 1940-1949, 1950-1959, 1960-1969, 1970-1979, 1980-1989, 1990-1999, 2000-2009, 2010-2019, 2020-2029, 2030-2039, 2040-2049, 2050-2059, 2060-2069, 2070-2079, 2080-2089, 2090-2099, 2100-2109, 2110-2119, 2120-2129, 2130-2139, 2140-2149, 2150-2159, 2160-2169, 2170-2179, 2180-2189, 2190-2199, 2200-2209, 2210-2219, 2220-2229, 2230-2239, 2240-2249, 2250-2259, 2260-2269, 2270-2279, 2280-2289, 2290-2299, 2300-2309, 2310-2319, 2320-2329, 2330-2339, 2340-2349, 2350-2359, 2360-2369, 2370-2379, 2380-2389, 2390-2399, 2400-2409, 2410-2419, 2420-2429, 2430-2439, 2440-2449, 2450-2459, 2460-2469, 2470-2479, 2480-2489, 2490-2499, 2500-2509, 2510-2519, 2520-2529, 2530-2539, 2540-2549, 2550-2559, 2560-2569, 2570-2579, 2580-2589, 2590-2599, 2600-2609, 2610-2619, 2620-2629, 2630-2639, 2640-2649, 2650-2659, 2660-2669, 2670-2679, 2680-2689, 2690-2699, 2700-2709, 2710-2719, 2720-2729, 2730-2739, 2740-2749, 2750-2759, 2760-2769, 2770-2779, 2780-2789, 2790-2799, 2800-2809, 2810-2819, 2820-2829, 2830-2839, 2840-2849, 2850-2859, 2860-2869, 2870-2879, 2880-2889, 2890-2899, 2900-2909, 2910-2919, 2920-2929, 2930-2939, 2940-2949, 2950-2959, 2960-2969, 2970-2979, 2980-2989, 2990-2999, 3000-3009, 3010-3019, 3020-3029, 3030-3039, 3040-3049, 3050-3059, 3060-3069, 3070-3079, 3080-3089, 3090-3099, 3100-3109, 3110-3119, 3120-3129, 3130-3139, 3140-3149, 3150-3159, 3160-3169, 3170-3179, 3180-3189, 3190-3199, 3200-3209, 3210-3219, 3220-3229, 3230-3239, 3240-3249, 3250-3259, 3260-3269, 3270-3279, 3280-3289, 3290-3299, 3300-3309, 3310-3319, 3320-3329, 3330-3339, 3340-3349, 3350-3359, 3360-3369, 3370-3379, 3380-3389, 3390-3399, 3400-3409, 3410-3419, 3420-3429, 3430-3439, 3440-3449, 3450-3459, 3460-3469, 3470-3479, 3480-3489, 3490-3499, 3500-3509, 3510-3519, 3520-3529, 3530-3539, 3540-3549, 3550-3559, 3560-3569, 3570-3579, 3580-3589, 3590-3599, 3600-3609, 3610-3619, 3620-3629, 3630-3639, 3640-3649, 3650-3659, 3660-3669, 3670-3679, 3680-3689, 3690-3699, 3700-3709, 3710-3719, 3720-3729, 3730-3739, 3740-3749, 3750-3759, 3760-3769, 3770-3779, 3780-3789, 3790-3799, 3800-3809, 3810-3819, 3820-3829, 3830-3839, 3840-3849, 3850-3859, 3860-3869, 3870-3879, 3880-3889, 3890-3899, 3900-3909, 3910-3919, 3920-3929, 3930-3939, 3940-3949, 3950-3959, 3960-3969, 3970-3979, 3980-3989, 3990-3999, 4000-4009, 4010-4019, 4020-4029, 4030-4039, 4040-4049, 4050-4059, 4060-4069, 4070-4079, 4080-4089, 4090-4099, 4100-4109, 4110-4119, 4120-4129, 4130-4139, 4140-4149, 4150-4159, 4160-4169, 4170-4179, 4180-4189, 4190-4199, 4200-4209, 4210-4219, 4220-4229, 4230-4239, 4240-4249, 4250-4259, 4260-4269, 4270-4279, 4280-4289, 4290-4299, 4300-4309, 4310-4319, 4320-4329, 4330-4339, 4340-4349, 4350-4359, 4360-4369, 4370-4379, 4380-4389, 4390-4399, 4400-4409, 4410-4419, 4420-4429, 4430-4439, 4440-4449, 4450-4459, 4460-4469, 4470-4479, 4480-4489, 4490-4499, 4500-4509, 4510-4519, 4520-4529, 4530-4539, 4540-4549, 4550-4559, 4560-4569, 4570-4579, 4580-4589, 4590-4599, 4600-4609, 4610-4619, 4620-4629, 4630-4639, 4640-4649, 4650-4659, 4660-4669, 4670-4679, 4680-4689, 4690-4699, 4700-4709, 4710-4719, 4720-4729, 4730-4739, 4740-4749, 4750-4759, 4760-4769, 4770-4779, 4780-4789, 4790-4799, 4800-4809, 4810-4819, 4820-4829, 4830-4839, 4840-4849, 4850-4859, 4860-4869, 4870-4879, 4880-4889, 4890-4899, 4900-4909, 4910-4919, 4920-4929, 4930-4939, 4940-4949, 4950-4959, 4960-4969, 4970-4979, 4980-4989, 4990-4999, 5000-5009, 5010-5019, 5020-5029, 5030-5039, 5040-5049, 5050-5059, 5060-5069, 5070-5079, 5080-5089, 5090-5099, 5100-5109, 5110-5119, 5120-5129, 5130-5139, 5140-5149, 5150-5159, 5160-5169, 5170-5179, 5180-5189, 5190-5199, 5200-5209, 5210-5219, 5220-5229, 5230-5239, 5240-5249, 5250-5259, 5260-5269, 5270-5279, 5280-5289, 5290-5299, 5300-5309, 5310-5319, 5320-5329, 5330-5339, 5340-5349, 5350-5359, 5360-5369, 5370-5379, 5380-5389, 5390-5399, 5400-5409, 5410-5419, 5420-5429, 5430-5439, 5440-5449, 5450-5459, 5460-5469, 5470-5479, 5480-5489, 5490-5499, 5500-5509, 5510-5519, 5520-5529, 5530-5539, 5540-5549, 5550-5559, 5560-5569, 5570-5579, 5580-5589, 5590-5599, 5600-5609, 5610-5619, 5620-5629, 5630-5639, 5640-5649, 5650-5659, 5660-5669, 5670-5679, 5680-5689, 5690-5699, 5700-5709, 5710-5719, 5720-5729, 5730-5739, 5740-5749, 5750-5759, 5760-5769, 5770-5779, 5780-5789, 5790-5799, 5800-5809, 5810-5819, 5820-5829, 5830-5839, 5840-5849, 5850-5859, 5860-5869, 5870-5879, 5880-5889, 5890-5899, 5900-5909, 5910-5919, 5920-5929, 5930-5939, 5940-5949, 5950-5959, 5960-5969, 5970-5979, 5980-5989, 5990-5999, 6000-6009, 6010-6019, 6020-6029, 6030-6039, 6040-6049, 6050-6059, 6060-6069, 6070-6079, 6080-6089, 6090-6099, 6100-6109, 6110-6119, 6120-6129, 6130-6139, 6140-6149, 6150-6159, 6160-6169, 6170-6179, 6180-6189, 6190-6199, 6200-6209, 6210-6219, 6220-6229, 6230-6239, 6240-6249, 6250-6259, 6260-6269, 6270-6279, 6280-6289, 6290-6299, 6300-6309, 6310-6319, 6320-6329, 6330-6339, 6340-6349, 6350-6359, 6360-6369, 6370-6379, 6380-6389, 6390-6399, 6400-6409, 6410-6419, 6420-6429, 6430-6439, 6440-6449, 6450-6459, 6460-6469, 6470-6479, 6480-6489, 6490-6499, 6500-6509, 6510-6519, 6520-6529, 6530-6539, 6540-6549, 6550-6559, 6560-6569, 6570-6579, 6580-6589, 6590-6599, 6600-6609, 6610-6619, 6620-6629, 6630-6639, 6640-6649, 6650-6659, 6660-6669, 6670-6679, 6680-6689, 6690-6699, 6700-6709, 6710-6719, 6720-6729, 6730-6739, 6740-6749, 6750-6759, 6760-6769, 6770-6779, 6780-6789, 6790-6799, 6800-6809, 6810-6819, 6820-6829, 6830-6839, 6840-6849, 6850-6859, 6860-6869, 6870-6879, 6880-6889, 6890-6899, 6900-6909, 6910-6919, 6920-6929, 6930-6939, 6940-6949, 6950-6959, 6960-6969, 6970-6979, 6980-6989, 6990-6999, 7000-7009, 7010-7019, 7020-7029, 7030-7039, 7040-7049, 7050-7059, 7060-7069, 7070-7079, 7080-7089, 7090-7099, 7100-7109, 7110-7119, 7120-7129, 7130-7139, 7140-7149, 7150-7159, 7160-7169, 7170-7179, 7180-7189, 7190-7199, 7200-7209, 7210-7219, 7220-7229, 7230-7239, 7240-7249, 7250-7259, 7260-7269, 7270-7279, 7280-7289, 7290-7299, 7300-7309, 7310-7319, 7320-7329, 7330-7339, 7340-7349, 7350-7359, 7360-7369, 7370-7379, 7380-7389, 7390-7399, 7400-7409, 7410-7419, 7420-7429, 7430-7439, 7440-7449, 7450-7459, 7460-7469, 7470-7479, 7480-7489, 7490-7499, 7500-7509, 7510-7519, 7520-7529, 7530-7539, 7540-7549, 7550-7559, 7560-7569, 7570-7579, 7580-7589, 7590-7599, 7600-7609, 7610-7619, 7620-7629, 7630-7639, 7640-7649, 7650-7659, 7660-7669, 7670-7679, 7680-7689, 7690-7699, 7700-7709, 7710-7719, 7720-7729, 7730-7739, 7740-7749, 7750-7759, 7760-7769, 7770-7779, 7780-7789, 7790-7799, 7800-7809, 7810-7819, 7820-7829, 7830-7839, 7840-7849, 7850-7859, 7860-7869, 7870-7879, 7880-7889, 7890-7899, 7900-7909, 7910-7919, 7920-7929, 7930-7939, 7940-7949, 7950-7959, 7960-7969, 7970-7979, 7980-7989, 7990-7999, 8000-8009, 8010-8019, 8020-8029, 8030-8039, 8040-8049, 8050-8059, 8060-8069, 8070-8079, 8080-8089, 8090-8099, 8100-8109, 8110-8119, 8120-8129, 8130-8139, 8140-8149, 8150-8159, 8160-8169, 8170-8179, 8180-8189, 8190-8199, 8200-8209, 8210-8219, 8220-8229, 8230-8239, 8240-8249, 8250-8259, 8260-8269, 8270-8279, 8280-8289, 8290-8299, 8300-8309, 8310-8319, 8320-8329, 8330-8339, 8340-8349, 8350-8359, 8360-8369, 8370-8379, 8380-8389, 8390-8399,

TABLE 1.—Wheat: Acreage, production, value, exports, etc., United States, 1849, 1859, 1868-1929—Continued

| Year | Acreage harvested | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Spring wheat, price per bushel at Chicago, year beginning July 1 | No. 2 red winter wheat, price per bushel at Chicago, year beginning July 1 | Foreign trade, including flour, year beginning July 1 | | | |
|------------------------|-------------------|------------------------|-------------|---|-------------------|--|--|---|-------------|-------------|--------------------------|
| | | | | | | | | Domestic exports | Imports | Net exports | |
| | | | | | | | | | | Total | Percentage of production |
| | 1,000 acres | Bush. | 1,000 bush. | Cts. | 1,000 dolls. | Cts. | Cts. | 1,000 bush. | 1,000 bush. | 1,000 bush. | Per cent |
| 1894... | 39,425 | 13.1 | 516,485 | 48.9 | 252,709 | 57 | 57 | 148,630 | 1,439 | 147,740 | 28.6 |
| 1895... | 40,848 | 13.9 | 569,456 | 50.3 | 286,539 | 61 | 62 | 130,099 | 2,117 | 130,345 | 22.9 |
| 1896... | 43,916 | 12.4 | 544,193 | 71.7 | 390,346 | 70 | 67 | 148,767 | 1,545 | 148,725 | 27.3 |
| 1897... | 46,046 | 13.3 | 610,254 | 80.9 | 493,683 | 91 | 86 | 221,143 | 2,060 | 220,965 | 36.2 |
| 1898... | 51,007 | 15.1 | 772,163 | 58.2 | 440,022 | 71 | 90 | 227,240 | 1,875 | 227,300 | 29.4 |
| 1899... | 52,589 | 12.5 | 658,634 | | | | | | | | |
| 1899... | 52,589 | 12.1 | 636,051 | 58.6 | 372,982 | 70 | 72 | 190,772 | 320 | 190,749 | 30.0 |
| 1900... | 51,387 | 11.7 | 602,708 | 62.0 | 373,578 | 75 | 76 | 220,653 | 603 | 220,723 | 36.6 |
| 1901... | 52,473 | 15.0 | 788,638 | 62.6 | 493,766 | 74 | 76 | 239,212 | 121 | 239,137 | 30.3 |
| 1902... | 49,649 | 14.6 | 724,808 | 63.0 | 456,851 | 77 | 75 | 207,835 | 1,080 | 208,016 | 28.7 |
| 1903... | 51,632 | 12.9 | 663,923 | 69.5 | 461,439 | 90 | 83 | 124,977 | 220 | 124,926 | 18.8 |
| 1904... | 47,825 | 12.5 | 596,911 | 92.4 | 551,788 | 114 | 100 | 46,319 | 3,296 | 43,612 | 7.3 |
| 1905... | 49,389 | 14.7 | 726,819 | 74.6 | 542,543 | 89 | 88 | 101,089 | 273 | 100,849 | 13.9 |
| 1906... | 47,800 | 15.8 | 756,775 | 66.2 | 501,316 | 84 | 77 | 150,597 | 602 | 150,594 | 19.9 |
| 1907... | 45,116 | 14.1 | 637,981 | 86.5 | 552,074 | 107 | 90 | 166,525 | 530 | 166,304 | 26.1 |
| 1908... | 45,970 | 14.0 | 644,656 | 92.2 | 594,128 | 116 | 96 | 116,373 | 475 | 115,901 | 18.0 |
| 1909... | 44,263 | 15.4 | 685,379 | | | | | | | | |
| 1909... | 44,262 | 15.8 | 700,434 | 98.4 | 688,108 | 114 | 110 | 89,173 | 845 | 88,465 | 12.6 |
| 1910... | 45,681 | 13.9 | 635,121 | 88.3 | 561,051 | 107 | 102 | 71,338 | 1,175 | 70,164 | 11.0 |
| 1911... | 49,543 | 12.5 | 621,338 | 87.4 | 543,063 | 110 | 90 | 81,891 | 3,445 | 78,447 | 12.6 |
| 1912... | 45,814 | 15.9 | 730,267 | 76.0 | 555,280 | 94 | 103 | 145,159 | 1,304 | 143,938 | 19.7 |
| 1913... | 50,184 | 15.2 | 763,380 | 79.9 | 610,122 | 93 | 88 | 147,955 | 2,402 | 146,306 | 19.2 |
| 1914... | 53,541 | 16.6 | 891,017 | 98.6 | 878,680 | 132 | 108 | 335,702 | 728 | 335,162 | 37.6 |
| 1915... | 60,469 | 17.0 | 1,025,801 | 91.9 | 942,303 | 120 | 113 | 246,221 | 7,254 | 239,591 | 23.4 |
| 1916... | 52,316 | 12.2 | 636,318 | 160.3 | 1,019,968 | 196 | 168 | 205,962 | 24,960 | 181,067 | 28.5 |
| 1917... | 45,089 | 14.1 | 636,655 | 200.8 | 1,278,112 | 227 | 225 | 132,579 | 31,215 | 102,775 | 16.1 |
| 1918... | 59,181 | 15.6 | 921,438 | 204.2 | 1,881,826 | 234 | 222 | 287,402 | 11,289 | 276,615 | 30.0 |
| 1919... | 75,099 | 12.9 | 945,403 | | | | | | | | |
| 1919... | 75,694 | 12.8 | 967,979 | 214.9 | 2,080,056 | 276 | 224 | 222,030 | 5,511 | 216,671 | 22.4 |
| 1920... | 61,143 | 13.6 | 833,027 | 143.7 | 1,197,263 | 198 | 223 | 359,313 | 57,682 | 312,625 | 37.5 |
| 1921... | 63,696 | 12.8 | 814,905 | 92.6 | 754,834 | 136 | 125 | 282,566 | 17,375 | 265,590 | 32.6 |
| 1922... | 62,317 | 13.9 | 867,598 | 100.7 | 873,412 | 122 | 114 | 224,900 | 20,031 | 205,079 | 23.6 |
| 1923... | 59,659 | 13.4 | 797,394 | 92.3 | 736,006 | 119 | 102 | 159,880 | 28,079 | 131,892 | 16.5 |
| 1924... | 60,862 | 15.7 | 800,877 | | | | | | | | |
| 1924... | 52,535 | 16.5 | 864,428 | 129.9 | 1,123,086 | 155 | 158 | 260,803 | 6,201 | 254,695 | 29.5 |
| 1925... | 52,367 | 12.9 | 676,765 | 141.6 | 958,364 | 166 | 164 | 108,035 | 15,679 | 92,669 | 13.7 |
| 1926... | 56,359 | 14.8 | 831,381 | 119.8 | 990,308 | 140 | 138 | 219,160 | 13,264 | 205,994 | 24.8 |
| 1927... | 58,784 | 14.9 | 878,374 | 111.5 | 979,813 | 140 | 140 | 203,259 | 15,734 | 190,578 | 21.7 |
| 1928... | 58,272 | 15.7 | 914,876 | 97.0 | 887,184 | 118 | 138 | 163,687 | 21,442 | 142,301 | 15.8 |
| 1929 ¹⁰ ... | 61,141 | 13.2 | 806,508 | 104.3 | 840,921 | | | | | | |

* Weighted average for 11 months

* Weighted average for 10 months.

¹⁰ Preliminary.

STATISTICS OF GRAINS

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TABLE 2.—Wheat: Acreage harvested and production, by States, average 1923-1927, annual 1926-1929

| State and division | Acreage harvested | | | | | Production | | | | |
|---------------------|-----------------------|----------------|----------------|----------------|-------------------|-----------------------|------------------|------------------|------------------|-------------------|
| | Av., 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ | Av., 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Maine..... | 5 | 6 | 4 | 4 | 4 | 124 | 120 | 72 | 80 | 92 |
| Vermont..... | 2 | 2 | 1 | 1 | 1 | 41 | 40 | 20 | 16 | 18 |
| New York..... | 324 | 279 | 301 | 316 | 287 | 6,290 | 4,887 | 6,291 | 4,702 | 4,584 |
| New Jersey..... | 61 | 60 | 60 | 60 | 62 | 1,320 | 1,320 | 1,380 | 1,200 | 1,178 |
| Pennsylvania..... | 1,164 | 1,177 | 1,098 | 1,108 | 1,119 | 21,883 | 23,533 | 20,301 | 17,171 | 20,138 |
| North Atlantic..... | 1,555 | 1,524 | 1,464 | 1,489 | 1,473 | 29,610 | 29,900 | 28,064 | 23,169 | 26,010 |
| Ohio..... | 1,847 | 1,795 | 1,615 | 872 | 1,732 | 33,997 | 40,384 | 29,068 | 9,475 | 33,770 |
| Indiana..... | 1,809 | 1,703 | 1,790 | 910 | 1,631 | 30,143 | 34,048 | 27,749 | 10,040 | 27,723 |
| Illinois..... | 2,585 | 2,283 | 2,509 | 1,563 | 2,451 | 42,650 | 41,034 | 34,844 | 22,939 | 36,537 |
| Michigan..... | 911 | 984 | 897 | 887 | 904 | 17,707 | 17,998 | 19,270 | 14,202 | 16,810 |
| Wisconsin..... | 124 | 128 | 145 | 104 | 105 | 2,553 | 2,599 | 3,142 | 2,141 | 2,190 |
| Minnesota..... | 1,902 | 1,929 | 1,763 | 1,532 | 1,372 | 27,451 | 24,811 | 20,925 | 22,964 | 19,944 |
| Iowa..... | 478 | 378 | 441 | 452 | 454 | 9,063 | 8,078 | 8,236 | 8,723 | 8,794 |
| Missouri..... | 1,822 | 1,403 | 1,568 | 1,511 | 1,730 | 23,573 | 21,474 | 15,700 | 19,194 | 17,300 |
| North Dakota..... | 9,531 | 9,653 | 10,246 | 10,810 | 9,918 | 104,902 | 77,081 | 130,191 | 155,358 | 93,396 |
| South Dakota..... | 2,587 | 1,917 | 3,037 | 3,360 | 3,114 | 30,301 | 11,611 | 45,386 | 34,928 | 30,247 |
| Nebraska..... | 3,124 | 3,077 | 3,630 | 3,672 | 3,548 | 47,594 | 40,085 | 73,826 | 69,919 | 66,555 |
| Kansas..... | 9,362 | 10,147 | 9,946 | 10,473 | 11,516 | 116,513 | 150,084 | 111,327 | 177,833 | 138,060 |
| North Central..... | 36,081 | 35,397 | 37,587 | 36,146 | 38,475 | 486,447 | 469,287 | 519,664 | 547,716 | 481,326 |
| Delaware..... | 102 | 103 | 98 | 102 | 101 | 1,899 | 2,060 | 1,862 | 1,836 | 1,919 |
| Maryland..... | 528 | 520 | 525 | 530 | 541 | 10,193 | 11,960 | 9,188 | 8,745 | 9,468 |
| Virginia..... | 694 | 687 | 687 | 673 | 700 | 9,650 | 11,336 | 8,381 | 9,758 | 8,960 |
| West Virginia..... | 153 | 147 | 135 | 122 | 134 | 2,101 | 2,352 | 1,796 | 1,586 | 1,782 |
| North Carolina..... | 459 | 447 | 483 | 444 | 457 | 5,389 | 6,303 | 5,168 | 5,150 | 5,347 |
| South Carolina..... | 82 | 50 | 80 | 64 | 64 | 948 | 800 | 880 | 800 | 768 |
| Georgia..... | 119 | 104 | 125 | 94 | 85 | 1,242 | 1,560 | 1,150 | 1,034 | 850 |
| South Atlantic..... | 2,136 | 2,058 | 2,133 | 2,029 | 2,082 | 31,422 | 36,371 | 28,425 | 28,909 | 29,094 |
| Kentucky..... | 321 | 258 | 296 | 125 | 240 | 4,111 | 4,773 | 2,812 | 1,000 | 2,832 |
| Tennessee..... | 418 | 440 | 528 | 422 | 405 | 4,796 | 7,920 | 3,696 | 3,714 | 3,645 |
| Alabama..... | 8 | 7 | 7 | 4 | 4 | 91 | 94 | 74 | 44 | 40 |
| Mississippi..... | 5 | 4 | 6 | 3 | 4 | 76 | 68 | 102 | 60 | 68 |
| Arkansas..... | 38 | 30 | 28 | 22 | 26 | 453 | 405 | 322 | 253 | 312 |
| Oklahoma..... | 3,674 | 4,214 | 3,708 | 4,413 | 4,236 | 46,240 | 73,745 | 33,372 | 59,576 | 44,478 |
| Texas..... | 1,479 | 1,802 | 1,850 | 2,016 | 2,520 | 19,783 | 32,796 | 17,945 | 22,176 | 37,800 |
| South Central..... | 5,943 | 6,755 | 6,423 | 7,005 | 7,435 | 75,550 | 119,801 | 58,323 | 86,823 | 89,175 |
| Montana..... | 3,421 | 3,570 | 3,850 | 4,275 | 4,166 | 51,896 | 44,744 | 80,208 | 77,998 | 40,098 |
| Idaho..... | 1,004 | 1,045 | 1,171 | 1,160 | 1,083 | 25,845 | 24,633 | 32,374 | 28,792 | 25,515 |
| Wyoming..... | 179 | 198 | 226 | 243 | 233 | 3,109 | 3,714 | 4,186 | 3,897 | 3,331 |
| Colorado..... | 1,388 | 1,485 | 1,419 | 1,339 | 1,397 | 18,337 | 18,793 | 20,112 | 18,564 | 18,012 |
| New Mexico..... | 141 | 249 | 55 | 186 | 305 | 2,213 | 5,653 | 570 | 2,054 | 5,742 |
| Arizona..... | 40 | 38 | 58 | 47 | 42 | 980 | 950 | 1,450 | 1,269 | 1,134 |
| Utah..... | 237 | 237 | 242 | 257 | 266 | 5,431 | 5,505 | 5,678 | 6,861 | 6,403 |
| Nevada..... | 17 | 17 | 18 | 18 | 16 | 429 | 408 | 460 | 482 | 404 |
| Washington..... | 2,147 | 2,107 | 2,261 | 2,271 | 2,430 | 45,437 | 40,901 | 58,436 | 48,644 | 44,910 |
| Oregon..... | 1,011 | 1,026 | 1,065 | 1,027 | 1,058 | 21,176 | 18,706 | 26,782 | 23,318 | 23,114 |
| California..... | 639 | 653 | 812 | 780 | 680 | 11,785 | 12,015 | 13,642 | 16,380 | 12,240 |
| Far Western..... | 10,225 | 10,625 | 11,177 | 11,603 | 11,676 | 186,638 | 176,022 | 243,898 | 228,259 | 180,903 |
| United States..... | 55,941 | 56,359 | 58,784 | 58,272 | 61,141 | 809,068 | 831,381 | 878,374 | 914,876 | 806,508 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board

¹ Preliminary.

TABLE 3.—Wheat, winter: Acreage harvested and production, by States, average 1923-1927, annual 1926-1929

| State and division | Acreage harvested | | | | | Production | | | | |
|---------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | Av., 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ | Av., 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| New York..... | 313 | 270 | 299 | 306 | 278 | 6,105 | 4,725 | 6,069 | 4,529 | 4,448 |
| New Jersey..... | 61 | 60 | 60 | 60 | 62 | 1,271 | 1,320 | 1,380 | 1,200 | 1,178 |
| Pennsylvania..... | 1,159 | 1,170 | 1,090 | 1,101 | 1,112 | 21,795 | 23,400 | 20,165 | 17,066 | 20,016 |
| North Atlantic..... | 1,533 | 1,500 | 1,439 | 1,467 | 1,452 | 29,171 | 29,445 | 27,614 | 22,795 | 25,642 |
| Ohio..... | 1,841 | 1,789 | 1,610 | 864 | 1,728 | 33,871 | 40,252 | 28,980 | 9,331 | 33,696 |
| Indiana..... | 1,804 | 1,697 | 1,782 | 900 | 1,627 | 30,057 | 33,940 | 27,621 | 9,900 | 27,659 |
| Illinois..... | 2,474 | 2,163 | 2,293 | 1,261 | 2,270 | 40,654 | 38,934 | 30,956 | 17,654 | 33,369 |
| Michigan..... | 905 | 979 | 891 | 882 | 900 | 17,607 | 17,916 | 19,156 | 14,112 | 16,740 |
| Wisconsin..... | 67 | 65 | 73 | 42 | 39 | 1,426 | 1,339 | 1,716 | 777 | 936 |
| Minnesota..... | 145 | 146 | 155 | 165 | 150 | 2,848 | 2,555 | 3,317 | 2,640 | 3,150 |
| Iowa..... | 443 | 342 | 400 | 411 | 407 | 8,550 | 7,524 | 7,600 | 8,014 | 8,018 |
| Missouri..... | 1,814 | 1,391 | 1,558 | 1,496 | 1,720 | 23,451 | 21,282 | 15,580 | 18,999 | 17,200 |
| South Dakota..... | 103 | 75 | 105 | 105 | 94 | 1,349 | 638 | 1,800 | 1,200 | 1,316 |
| Nebraska..... | 2,904 | 2,881 | 3,457 | 3,492 | 3,354 | 44,760 | 37,165 | 70,868 | 66,697 | 53,664 |
| Kansas..... | 9,352 | 10,139 | 9,936 | 10,433 | 11,476 | 116,443 | 150,057 | 111,283 | 177,361 | 137,712 |
| North Central..... | 21,851 | 21,667 | 22,260 | 20,051 | 23,765 | 321,016 | 351,602 | 318,967 | 326,745 | 333,460 |
| Delaware..... | 102 | 103 | 98 | 102 | 101 | 1,899 | 2,060 | 1,862 | 1,836 | 1,919 |
| Maryland..... | 528 | 520 | 525 | 530 | 541 | 10,193 | 11,960 | 9,188 | 8,745 | 9,468 |
| Virginia..... | 694 | 687 | 687 | 673 | 700 | 9,650 | 11,336 | 8,381 | 9,758 | 8,960 |
| West Virginia..... | 153 | 147 | 135 | 122 | 134 | 2,101 | 2,352 | 1,796 | 1,586 | 1,782 |
| North Carolina..... | 459 | 447 | 483 | 444 | 457 | 5,389 | 6,303 | 5,168 | 5,150 | 5,347 |
| South Carolina..... | 82 | 50 | 80 | 64 | 64 | 948 | 800 | 880 | 800 | 768 |
| Georgia..... | 119 | 104 | 125 | 94 | 85 | 1,242 | 1,560 | 1,150 | 1,034 | 850 |
| South Atlantic..... | 2,136 | 2,058 | 2,133 | 2,029 | 2,082 | 31,422 | 36,371 | 28,425 | 28,909 | 29,094 |
| Kentucky..... | 321 | 258 | 296 | 125 | 240 | 4,111 | 4,773 | 2,812 | 1,000 | 2,832 |
| Tennessee..... | 418 | 440 | 528 | 422 | 405 | 4,796 | 7,920 | 3,696 | 3,714 | 3,645 |
| Alabama..... | 8 | 7 | 7 | 4 | 4 | 91 | 94 | 74 | 44 | 40 |
| Mississippi..... | 5 | 4 | 6 | 3 | 4 | 70 | 68 | 102 | 60 | 68 |
| Arkansas..... | 38 | 30 | 28 | 22 | 26 | 453 | 405 | 322 | 253 | 312 |
| Oklahoma..... | 3,674 | 4,214 | 3,708 | 4,413 | 4,236 | 46,240 | 73,745 | 33,372 | 59,576 | 44,478 |
| Texas..... | 1,479 | 1,802 | 1,850 | 2,016 | 2,520 | 19,783 | 32,796 | 17,945 | 22,176 | 37,800 |
| South Central..... | 5,943 | 6,755 | 6,423 | 7,005 | 7,435 | 75,550 | 119,801 | 58,323 | 86,823 | 89,175 |
| Montana..... | 527 | 521 | 648 | 803 | 522 | 9,202 | 7,204 | 14,256 | 12,045 | 7,308 |
| Idaho..... | 435 | 447 | 501 | 456 | 520 | 10,356 | 10,281 | 12,274 | 10,488 | 11,440 |
| Wyoming..... | 36 | 48 | 54 | 75 | 82 | 597 | 864 | 918 | 1,125 | 1,066 |
| Colorado..... | 1,096 | 1,207 | 1,086 | 923 | 1,043 | 13,618 | 14,484 | 14,118 | 11,076 | 11,994 |
| New Mexico..... | 102 | 212 | 25 | 150 | 263 | 1,616 | 4,876 | 150 | 1,500 | 4,734 |
| Arizona..... | 40 | 38 | 58 | 47 | 42 | 980 | 950 | 1,450 | 1,269 | 1,134 |
| Utah..... | 145 | 149 | 152 | 162 | 166 | 2,784 | 3,129 | 2,888 | 3,726 | 3,403 |
| Nevada..... | 4 | 5 | 4 | 4 | 4 | 94 | 120 | 96 | 104 | 104 |
| Washington..... | 999 | 847 | 1,228 | 1,424 | 1,210 | 24,589 | 19,481 | 36,226 | 35,600 | 27,830 |
| Oregon..... | 758 | 890 | 900 | 837 | 896 | 16,478 | 16,720 | 23,400 | 20,088 | 19,712 |
| California..... | 639 | 653 | 812 | 780 | 680 | 11,785 | 12,015 | 13,642 | 16,380 | 12,240 |
| Far Western..... | 4,781 | 5,007 | 5,468 | 5,661 | 5,428 | 92,098 | 90,214 | 119,418 | 113,401 | 100,965 |
| United States..... | 36,244 | 36,987 | 37,723 | 36,213 | 40,162 | 549,257 | 627,433 | 552,747 | 578,673 | 578,336 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹Preliminary.

STATISTICS OF GRAINS

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TABLE 4.—Wheat, spring: Acreage harvested and production, by States, average 1923-1927, annual 1926-1929

SPRING WHEAT OTHER THAN DURUM

| State and division | Acreage harvested | | | | | Production | | | | |
|---------------------|-----------------------|----------------|----------------|----------------|-------------------|-----------------------|------------------|------------------|------------------|-------------------|
| | Av., 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ | Av., 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Maine..... | 5 | 6 | 4 | 4 | 4 | 124 | 120 | 72 | 80 | 92 |
| Vermont..... | 2 | 2 | 1 | 1 | 1 | 41 | 40 | 20 | 16 | 18 |
| New York..... | 10 | 9 | 12 | 10 | 9 | 186 | 162 | 222 | 173 | 136 |
| Pennsylvania..... | 19 | 7 | 8 | 7 | 7 | 146 | 133 | 136 | 105 | 122 |
| North Atlantic..... | 23 | 24 | 25 | 22 | 21 | 439 | 455 | 450 | 374 | 368 |
| Ohio..... | 6 | 6 | 5 | 8 | 4 | 126 | 132 | 88 | 144 | 74 |
| Indiana..... | 5 | 6 | 8 | 10 | 4 | 86 | 108 | 128 | 140 | 64 |
| Illinois..... | 110 | 120 | 216 | 302 | 181 | 1,996 | 2,100 | 3,888 | 5,285 | 3,168 |
| Michigan..... | 6 | 5 | 6 | 5 | 4 | 100 | 82 | 114 | 90 | 70 |
| Wisconsin..... | 58 | 63 | 72 | 62 | 66 | 1,127 | 1,260 | 1,426 | 1,364 | 1,254 |
| Minnesota..... | 1,566 | 1,592 | 1,340 | 1,032 | 1,001 | 21,803 | 19,582 | 14,070 | 14,964 | 13,413 |
| Iowa..... | 35 | 36 | 41 | 41 | 47 | 513 | 554 | 636 | 709 | 776 |
| Missouri..... | 8 | 12 | 10 | 15 | 10 | 123 | 192 | 120 | 195 | 100 |
| North Dakota..... | 6,007 | 5,849 | 6,024 | 5,660 | 6,056 | 60,935 | 40,943 | 71,083 | 78,108 | 56,321 |
| South Dakota..... | 1,527 | 1,077 | 1,953 | 1,933 | 1,817 | 16,485 | 5,924 | 27,342 | 19,523 | 17,262 |
| Nebraska..... | 220 | 196 | 173 | 180 | 194 | 2,833 | 2,920 | 2,958 | 3,222 | 2,891 |
| Kansas..... | 10 | 8 | 10 | 40 | 40 | 70 | 27 | 44 | 472 | 348 |
| North Central..... | 9,558 | 8,970 | 9,858 | 9,288 | 9,424 | 106,197 | 73,824 | 121,897 | 124,216 | 95,741 |
| Montana..... | 2,834 | 3,035 | 3,187 | 3,443 | 3,615 | 41,940 | 37,330 | 65,652 | 65,417 | 32,535 |
| Idaho..... | 569 | 598 | 670 | 704 | 563 | 15,489 | 14,352 | 20,100 | 18,304 | 14,075 |
| Wyoming..... | 143 | 150 | 172 | 168 | 151 | 2,513 | 2,850 | 3,268 | 2,772 | 2,265 |
| Colorado..... | 292 | 278 | 333 | 416 | 354 | 4,719 | 4,309 | 5,994 | 7,488 | 6,018 |
| New Mexico..... | 39 | 37 | 30 | 36 | 42 | 597 | 777 | 420 | 554 | 1,008 |
| Utah..... | 92 | 88 | 90 | 95 | 100 | 2,647 | 2,376 | 2,790 | 3,135 | 3,000 |
| Nevada..... | 13 | 12 | 14 | 14 | 12 | 335 | 288 | 364 | 378 | 300 |
| Washington..... | 1,149 | 1,260 | 1,033 | 847 | 1,220 | 20,848 | 21,420 | 22,210 | 13,044 | 17,080 |
| Oregon..... | 253 | 146 | 165 | 190 | 162 | 4,699 | 1,986 | 3,382 | 3,230 | 3,402 |
| Far Western..... | 5,384 | 5,604 | 5,694 | 5,913 | 6,219 | 93,787 | 85,688 | 124,180 | 114,322 | 79,683 |
| United States..... | 14,965 | 14,598 | 15,577 | 15,223 | 15,664 | 200,423 | 159,967 | 246,527 | 238,912 | 175,792 |

DURUM WHEAT

| | | | | | | | | | | |
|-------------------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| Minnesota..... | 191 | 191 | 268 | 335 | 221 | 2,800 | 2,674 | 3,538 | 5,360 | 3,381 |
| North Dakota..... | 3,524 | 3,804 | 4,222 | 5,150 | 3,862 | 43,967 | 36,138 | 59,108 | 77,250 | 37,075 |
| South Dakota..... | 957 | 765 | 979 | 1,322 | 1,203 | 12,467 | 5,049 | 16,154 | 14,145 | 11,669 |
| Montana..... | 60 | 14 | 15 | 29 | 29 | 754 | 120 | 300 | 536 | 255 |
| Total..... | 4,732 | 4,774 | 5,484 | 6,836 | 5,315 | 59,988 | 43,981 | 79,100 | 97,291 | 52,380 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.

² 3-year average.

TABLE 5.—Wheat: Yield per acre and price per bushel December 1, by States, averages, and annual 1924-1929

ALL WHEAT

| State and division | Yield per acre | | | | | | | Price per bushel received by producers | | | | | | |
|---------------------|-----------------------|-------|-------|-------|-------|-------|-------|--|-------|-------|-------|-------|-------|-------|
| | Av., 1918- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Av., 1923- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| Maine..... | 22.3 | 26.0 | 28.0 | 20.0 | 18.0 | 20.0 | 23.0 | 162 | 170 | 170 | 175 | 175 | 165 | 160 |
| Vermont..... | 19.5 | 21.0 | 21.0 | 20.0 | 20.0 | 16.0 | 18.0 | 143 | 152 | 150 | 132 | 140 | 131 | 122 |
| New York..... | 19.6 | 18.7 | 19.5 | 17.5 | 20.9 | 14.9 | 16.0 | 133 | 144 | 152 | 132 | 125 | 137 | 124 |
| New Jersey..... | 19.4 | 18.5 | 21.0 | 22.0 | 23.0 | 20.0 | 19.0 | 133 | 157 | 143 | 132 | 125 | 124 | 123 |
| Pennsylvania..... | 18.1 | 16.5 | 20.0 | 20.0 | 18.5 | 15.5 | 18.0 | 129 | 144 | 147 | 129 | 127 | 129 | 121 |
| North Atlantic..... | 18.6 | 17.1 | 20.0 | 19.6 | 19.2 | 15.6 | 17.7 | 130.4 | 144.6 | 148.0 | 129.8 | 126.6 | 130.4 | 121.7 |
| Ohio..... | 17.0 | 18.0 | 15.0 | 22.5 | 18.0 | 10.9 | 19.5 | 131 | 145 | 158 | 127 | 125 | 131 | 116 |
| Indiana..... | 15.8 | 17.0 | 14.5 | 20.0 | 15.5 | 11.0 | 17.0 | 129 | 142 | 155 | 124 | 124 | 124 | 112 |
| Illinois..... | 17.0 | 16.1 | 16.1 | 18.0 | 13.9 | 14.7 | 14.9 | 124 | 136 | 150 | 122 | 120 | 112 | 111 |
| Michigan..... | 17.6 | 24.0 | 17.0 | 18.3 | 21.5 | 16.0 | 18.6 | 126 | 138 | 156 | 122 | 120 | 129 | 113 |
| Wisconsin..... | 18.6 | 24.0 | 20.1 | 20.3 | 21.7 | 20.6 | 20.9 | 121 | 128 | 136 | 126 | 110 | 96 | 105 |
| Minnesota..... | 13.6 | 22.1 | 13.4 | 12.9 | 11.9 | 15.0 | 14.5 | 119 | 130 | 137 | 123 | 117 | 106 | 106 |
| Iowa..... | 18.7 | 20.2 | 16.2 | 21.4 | 18.7 | 19.3 | 19.5 | 118 | 127 | 136 | 120 | 112 | 101 | 100 |
| Missouri..... | 13.1 | 13.3 | 13.2 | 15.3 | 10.7 | 12.7 | 10.6 | 125 | 133 | 150 | 124 | 122 | 121 | 113 |
| North Dakota..... | 10.8 | 15.7 | 11.7 | 8.0 | 12.7 | 14.4 | 9.4 | 113 | 126 | 131 | 117 | 103 | 81 | 97 |
| South Dakota..... | 11.6 | 14.6 | 11.8 | 6.1 | 14.9 | 10.4 | 9.7 | 112 | 125 | 128 | 116 | 106 | 85 | 93 |
| Nebraska..... | 14.6 | 19.1 | 12.8 | 13.0 | 20.3 | 19.0 | 15.9 | 114 | 122 | 140 | 117 | 109 | 94 | 99 |
| Kansas..... | 13.0 | 16.3 | 9.0 | 14.8 | 11.2 | 17.0 | 12.0 | 121 | 128 | 148 | 119 | 117 | 94 | 100 |
| North Central..... | 13.2 | 16.8 | 12.1 | 13.3 | 13.8 | 15.2 | 12.5 | 119.1 | 129.6 | 141.8 | 120.3 | 112.2 | 93.7 | 102.9 |
| Delaware..... | 16.3 | 17.8 | 18.5 | 20.0 | 19.0 | 18.0 | 19.0 | 129 | 144 | 145 | 130 | 125 | 125 | 116 |
| Maryland..... | 17.3 | 15.8 | 21.0 | 23.0 | 17.5 | 16.5 | 17.5 | 131 | 145 | 151 | 130 | 127 | 127 | 118 |
| Virginia..... | 12.8 | 13.4 | 14.2 | 16.5 | 12.2 | 14.5 | 12.8 | 136 | 148 | 161 | 131 | 132 | 135 | 125 |
| West Virginia..... | 13.3 | 13.0 | 13.5 | 16.0 | 13.3 | 13.0 | 13.3 | 139 | 147 | 158 | 135 | 137 | 137 | 133 |
| North Carolina..... | 10.2 | 12.0 | 11.0 | 14.1 | 10.7 | 11.6 | 11.7 | 149 | 160 | 171 | 143 | 145 | 152 | 141 |
| South Carolina..... | 11.1 | 11.0 | 11.0 | 16.0 | 11.0 | 12.5 | 12.0 | 163 | 170 | 185 | 155 | 152 | 161 | 150 |
| Georgia..... | 10.3 | 9.5 | 10.5 | 15.0 | 9.2 | 11.0 | 10.0 | 161 | 169 | 182 | 150 | 155 | 167 | 155 |
| South Atlantic..... | 13.2 | 13.7 | 15.2 | 17.7 | 13.3 | 14.2 | 14.0 | 138.3 | 15.02 | 158.9 | 134.3 | 134.2 | 136.9 | 127.1 |
| Kentucky..... | 12.1 | 10.3 | 14.0 | 18.5 | 9.5 | 8.0 | 11.8 | 136 | 143 | 160 | 133 | 135 | 138 | 126 |
| Tennessee..... | 10.6 | 10.5 | 12.5 | 18.0 | 7.0 | 8.8 | 9.0 | 141 | 147 | 166 | 136 | 139 | 143 | 132 |
| Alabama..... | 10.4 | 10.0 | 11.0 | 13.4 | 10.6 | 11.0 | 10.0 | 156 | 162 | 175 | 160 | 155 | 157 | 152 |
| Mississippi..... | 14.6 | 12.4 | 18.0 | 17.0 | 17.0 | 20.0 | 17.0 | 137 | 150 | 160 | 129 | 135 | 137 | 135 |
| Arkansas..... | 11.4 | 11.5 | 13.0 | 13.5 | 11.5 | 11.5 | 12.0 | 129 | 133 | 150 | 128 | 125 | 122 | 129 |
| Oklahoma..... | 12.6 | 16.0 | 8.2 | 17.5 | 9.0 | 13.5 | 10.5 | 120 | 124 | 147 | 118 | 120 | 100 | 99 |
| Texas..... | 12.2 | 18.5 | 8.0 | 18.2 | 9.7 | 11.0 | 15.0 | 126 | 129 | 155 | 120 | 121 | 110 | 105 |
| South Central..... | 12.3 | 16.1 | 8.8 | 17.7 | 9.1 | 12.4 | 12.0 | 124.0 | 126.8 | 151.4 | 120.4 | 122.3 | 105.0 | 103.9 |
| Montana..... | 12.8 | 16.4 | 10.8 | 12.5 | 20.8 | 18.2 | 9.6 | 111 | 124 | 139 | 112 | 96 | 83 | 95 |
| Idaho..... | 23.5 | 19.4 | 28.1 | 23.6 | 27.6 | 24.8 | 23.6 | 108 | 131 | 125 | 106 | 98 | 90 | 95 |
| Wyoming..... | 17.7 | 15.2 | 17.5 | 18.8 | 18.5 | 16.0 | 14.3 | 103 | 111 | 124 | 107 | 94 | 83 | 89 |
| Colorado..... | 13.7 | 14.4 | 11.8 | 12.7 | 14.2 | 13.9 | 12.9 | 110 | 118 | 136 | 107 | 104 | 85 | 93 |
| New Mexico..... | 14.2 | 14.2 | 6.2 | 22.7 | 10.4 | 11.0 | 18.8 | 122 | 125 | 150 | 110 | 119 | 107 | 96 |
| Arizona..... | 24.2 | 21.0 | 23.0 | 25.0 | 25.0 | 27.0 | 27.0 | 144 | 141 | 175 | 130 | 135 | 130 | 135 |
| Utah..... | 21.1 | 16.5 | 26.2 | 23.2 | 23.5 | 26.7 | 24.1 | 112 | 130 | 130 | 105 | 102 | 98 | 102 |
| Nevada..... | 24.7 | 22.6 | 30.4 | 24.0 | 25.6 | 26.8 | 25.2 | 130 | 150 | 146 | 116 | 125 | 122 | 129 |
| Washington..... | 18.6 | 14.3 | 19.4 | 19.4 | 25.8 | 21.4 | 18.5 | 114 | 130 | 130 | 116 | 108 | 100 | 107 |
| Oregon..... | 19.9 | 16.5 | 19.6 | 18.2 | 25.1 | 22.7 | 21.8 | 117 | 129 | 136 | 120 | 112 | 103 | 111 |
| California..... | 17.2 | 15.0 | 19.0 | 18.4 | 16.8 | 21.0 | 18.0 | 132 | 154 | 148 | 130 | 118 | 118 | 120 |
| Far Western..... | 16.8 | 15.8 | 16.4 | 16.6 | 21.8 | 19.7 | 15.5 | 112.7 | 126.9 | 134.1 | 113.4 | 103.1 | 93.4 | 101.9 |
| United States..... | 14.1 | 16.5 | 12.9 | 14.8 | 14.9 | 15.7 | 13.2 | 119.0 | 129.9 | 141.6 | 119.8 | 111.5 | 97.0 | 104.3 |

DURUM WHEAT

| | | | | | | | | Price of No. 2 amber durum at Minneapolis | | | | | | |
|-------------------|------|------|------|------|------|------|------|---|-------|-------|-------|-------|-------|-------|
| Minnesota..... | 14.8 | 21.5 | 15.2 | 14.0 | 13.2 | 16.0 | 15.3 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| North Dakota..... | 12.1 | 16.3 | 14.6 | 9.5 | 14.0 | 15.0 | 9.6 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| South Dakota..... | 13.3 | 15.4 | 13.9 | 6.6 | 16.5 | 10.7 | 9.7 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Montana..... | 12.2 | 18.0 | 10.0 | 8.6 | 20.0 | 18.5 | 8.8 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Average..... | 12.4 | 16.3 | 14.4 | 9.2 | 14.4 | 14.2 | 9.9 | ----- | 156 | 144 | 155 | 132 | 113 | --- |

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STATISTICS OF GRAINS

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TABLE 6.—*Winter and spring wheat: Acreage sown and harvested, production, and farm value, United States, 1910-1929*

| Year | Winter wheat | | | | | Spring wheat including durum | | | | |
|-------------------------|--------------------------------|-------------------|------------------------|---------------|---|------------------------------|-------------------|------------------------|---------------|---|
| | Acreage sown in preceding fall | Acreage harvested | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Total farm value Dec. 1 | Acreage harvested | Average yield per acre | Production | Price per bushel received by producers Dec. 1 |
| | 1,000 acres | 1,000 acres | Bush. | 1,000 bushels | Cents | 1,000 dollars | 1,000 acres | Bush. | 1,000 bushels | Cents |
| 1910..... | 31,659 | 27,329 | 15.9 | 434,142 | 88.1 | 382,318 | 18,352 | 11.0 | 200,979 | 88.9 |
| 1911..... | 32,648 | 29,162 | 14.8 | 430,656 | 88.0 | 379,151 | 20,381 | 9.4 | 190,682 | 86.0 |
| 1912..... | 33,239 | 26,571 | 15.1 | 399,919 | 80.9 | 323,572 | 19,243 | 17.2 | 330,348 | 70.1 |
| 1913..... | 33,274 | 31,699 | 16.5 | 523,561 | 82.9 | 433,995 | 18,485 | 13.0 | 239,819 | 73.4 |
| 1914..... | 37,158 | 36,008 | 19.0 | 684,990 | 98.6 | 675,623 | 17,533 | 11.8 | 206,027 | 98.6 |
| 1915..... | 42,431 | 41,308 | 16.3 | 673,947 | 94.7 | 638,149 | 19,161 | 18.4 | 351,854 | 86.4 |
| 1916..... | 39,245 | 34,709 | 13.8 | 480,553 | 162.7 | 781,906 | 17,607 | 8.8 | 155,785 | 152.8 |
| 1917..... | 38,359 | 27,257 | 15.1 | 412,901 | 202.8 | 837,237 | 17,832 | 12.5 | 223,754 | 197.0 |
| 1918..... | 43,126 | 37,130 | 15.2 | 565,099 | 206.3 | 1,165,995 | 22,051 | 16.2 | 356,339 | 200.9 |
| 1919..... | 51,483 | 50,494 | 15.1 | 760,377 | 210.5 | 1,600,805 | 25,200 | 8.2 | 207,602 | 230.9 |
| 1920..... | 44,861 | 40,016 | 15.3 | 610,597 | 148.6 | 907,291 | 21,127 | 10.5 | 222,430 | 130.4 |
| 1921..... | 45,625 | 43,414 | 13.8 | 600,316 | 35.1 | 671,044 | 20,282 | 10.6 | 214,589 | 85.6 |
| 1922..... | 47,930 | 42,358 | 13.8 | 586,878 | 104.7 | 614,399 | 19,959 | 14.1 | 280,720 | 92.3 |
| 1923..... | 46,091 | 39,508 | 14.5 | 571,777 | 95.1 | 543,530 | 20,151 | 11.2 | 225,617 | 85.3 |
| 1924..... | 38,916 | 35,656 | 16.6 | 592,259 | 131.6 | 779,548 | 16,879 | 16.1 | 272,169 | 126.2 |
| 1925..... | 39,951 | 31,346 | 12.8 | 402,070 | 147.9 | 594,746 | 21,021 | 13.1 | 274,695 | 132.4 |
| 1926..... | 39,887 | 36,987 | 17.0 | 627,433 | 121.2 | 760,406 | 19,372 | 10.5 | 203,948 | 115.7 |
| 1927..... | 43,373 | 37,723 | 14.7 | 552,747 | 116.7 | 645,326 | 21,061 | 15.5 | 325,627 | 102.7 |
| 1928..... | 47,317 | 36,213 | 16.0 | 578,673 | 103.5 | 599,207 | 22,059 | 15.2 | 336,203 | 85.7 |
| 1929 ¹ | 42,820 | 40,162 | 14.4 | 578,336 | 106.5 | 616,128 | 20,979 | 10.9 | 228,172 | 98.5 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.

TABLE 7.—*Winter wheat: Percentage of acreage abandoned, average 1918-1927, annual 1925-1929¹*

| State | A.v., 1918-1927 | 1925 | 1926 | 1927 | 1928 | 1929 | State | A.v., 1918-1927 | 1925 | 1926 | 1927 | 1928 | 1929 |
|-------------|-----------------|-------|-------|-------|-------|-------|-------------|-----------------|-------|-------|-------|-------|-------|
| | P.ct. | P.ct. | P.ct. | P.ct. | P.ct. | P.ct. | | P.ct. | P.ct. | P.ct. | P.ct. | P.ct. | P.ct. |
| N. Y..... | 4.0 | 2.5 | 8.0 | 1.0 | 6.0 | 2.0 | Ky..... | 7.6 | 13.0 | 2.5 | 3.0 | 65.0 | 3.0 |
| N. J..... | 3.5 | 2.0 | 3.0 | 1.0 | 5.0 | 1.0 | Tenn..... | 5.1 | 6.0 | 1.7 | 5.0 | 28.0 | 4.0 |
| Pa..... | 2.4 | 2.0 | 2.0 | 2.5 | 9.0 | 1.0 | Ala..... | 7.3 | 6.0 | 3.0 | 10.0 | 15.0 | 3.0 |
| Ohio..... | 7.3 | 23.0 | 3.0 | 3.0 | 64.0 | 1.0 | Miss..... | 18.2 | 40.0 | 20.0 | 10.0 | 40.0 | 10.0 |
| Ind..... | 5.1 | 10.4 | 3.0 | 3.0 | 60.0 | 4.0 | Ark..... | 5.8 | 10.0 | 3.0 | 20.0 | 30.0 | 10.0 |
| Ill..... | 5.8 | 3.0 | 5.0 | 5.5 | 62.0 | 8.0 | Okla..... | 10.8 | 20.0 | 2.0 | 20.0 | 7.0 | 6.0 |
| Mich..... | 5.0 | 1.5 | 7.0 | 2.0 | 10.0 | 1.5 | Tex..... | 18.6 | 54.0 | 3.0 | 24.0 | 23.0 | 7.0 |
| Wis..... | 12.4 | 30.0 | 10.0 | 2.5 | 32.0 | 2.0 | Mont..... | 26.2 | 70.0 | 20.0 | 12.0 | 18.0 | 15.0 |
| Minn..... | 9.0 | 16.0 | 7.0 | 2.0 | 45.0 | 3.5 | Idaho..... | 6.4 | 15.0 | 6.0 | 4.0 | 5.0 | 3.0 |
| Iowa..... | 4.6 | 9.0 | 4.0 | 2.5 | 22.0 | 3.0 | Wyo..... | 10.0 | 15.0 | 4.0 | 12.0 | 10.0 | 12.0 |
| Mo..... | 4.8 | 4.0 | 5.5 | 11.0 | 32.0 | 4.0 | Colo..... | 18.6 | 30.0 | 20.0 | 30.0 | 40.0 | 20.0 |
| S. Dak..... | 15.6 | 25.0 | 20.0 | 10.0 | 40.0 | 5.0 | N. Mex..... | 35.7 | 80.0 | 3.0 | 89.0 | 45.0 | 20.0 |
| Nebr..... | 9.0 | 19.0 | 12.0 | 4.0 | 10.0 | 9.0 | Ariz..... | 6.2 | 3.0 | 2.0 | 1.0 | 1.0 | 2.0 |
| Kans..... | 15.3 | 20.0 | 11.0 | 20.0 | 15.2 | 5.0 | Utah..... | 3.4 | 2.0 | 2.0 | 3.0 | 2.0 | 2.5 |
| Del..... | 3.2 | 1.5 | 2.0 | 1.0 | 1.0 | 1.0 | Nev..... | 3.3 | 2.0 | 0 | 0 | 1.0 | 1.5 |
| Md..... | 2.5 | 1.5 | 1.5 | 1.5 | 3.0 | 1.5 | Wash..... | 14.7 | 70.0 | 4.0 | 6.0 | 6.0 | 10.0 |
| Va..... | 2.2 | 2.0 | 1.5 | 2.0 | 6.0 | 1.5 | Oreg..... | 9.2 | 65.0 | 3.0 | 1.0 | 3.0 | 3.0 |
| W. Va..... | 3.4 | 10.0 | 1.0 | 1.5 | 15.0 | 1.5 | Calif..... | 17.4 | 25.0 | 7.0 | 3.0 | 9.0 | 20.0 |
| N. C..... | 2.2 | 1.5 | 2.0 | 3.0 | 7.0 | 2.0 | U. S..... | 10.8 | 21.5 | 7.3 | 13.0 | 23.5 | 6.2 |
| S. C..... | 3.8 | 4.0 | 2.5 | 6.0 | 12.0 | 5.0 | | | | | | | |
| Ga..... | 9.8 | 5.0 | 3.0 | 8.0 | 15.0 | 6.0 | | | | | | | |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ For entire season, planting to harvest. Includes winter abandonment, which is estimated on May 1 of each season.

TABLE 8.—Wheat: Acreage, yield per acre, and production in specified countries, average 1909-1913, 1921-1925, annual 1927-1929

| Country | Acreage | | | Yield per acre | | | | Production | | | |
|----------------------------|--------------------|-------------|-------------|-------------------|--------------------|---------|---------|-------------------|--------------------|---------------|---------------|
| | Average, 1909-1913 | 1927 | 1928 | 1929, preliminary | Average, 1921-1925 | 1927 | 1928 | 1929, preliminary | Average, 1921-1925 | 1927 | 1928 |
| NORTHERN HEMISPHERE | | | | | | | | | | | |
| NORTH AMERICA | | | | | | | | | | | |
| Canada..... | 1,787 | 1,636 | 1,396 | 1,390 | 31.2 | 32.9 | 32.5 | 35.7 | 57,524 | 53,125 | 47,264 |
| United States..... | 9,945 | 22,460 | 24,119 | 23,455 | 38.9 | 38.3 | 36.2 | 42.5 | 2,251 | 2,427 | 2,315 |
| Mexico..... | 4,097 | 58,784 | 53,272 | 61,141 | 14.7 | 13.9 | 14.9 | 13.7 | 894,151 | 878,374 | 914,878 |
| Guatemala..... | 2,174 | 2,098 | 1,311 | 1,254 | 5.3 | 5.0 | 9.1 | 8.6 | 10,388 | 11,890 | 11,031 |
| | 24 | 23 | 20 | 18 | 9.2 | 9.2 | 9.6 | 8.4 | 222 | 220 | 167 |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | Bushels | Bushels | Bushels | Bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| EUROPE | | | | | | | | | | | |
| United Kingdom: | | | | | | | | | | | |
| England and Wales..... | 1,787 | 1,636 | 1,396 | 1,390 | 31.2 | 32.9 | 32.5 | 35.7 | 57,524 | 53,125 | 47,264 |
| Scotland..... | 57 | 67 | 58 | 51 | 38.9 | 38.3 | 36.2 | 42.5 | 2,251 | 2,427 | 2,315 |
| Northern Ireland..... | 85 | 4 | 31 | 28 | 37.4 | 33.3 | 41.8 | 38.3 | 1,131 | 1,421 | 1,186 |
| Irish Free State..... | 12 | 34 | 31 | 28 | 27.4 | 28.6 | 21.2 | 28.5 | 1,637 | 1,605 | 1,798 |
| Norway..... | 255 | 522 | 562 | 574 | 31.8 | 30.1 | 28.2 | 34.1 | 10,602 | 15,835 | 19,155 |
| Sweden..... | 12 | 252 | 252 | 247 | 41.1 | 42.1 | 32.3 | 45.8 | 8,973 | 9,408 | 12,214 |
| Denmark..... | 138 | 202 | 174 | 114 | 30.1 | 45.7 | 40.2 | 40.9 | 4,976 | 6,157 | 7,336 |
| Netherlands..... | 424 | 330 | 432 | 432 | 37.4 | 32.0 | 41.6 | 42.3 | 15,199 | 16,277 | 17,986 |
| Belgium..... | 27 | 301 | 425 | 21 | 22.2 | 17.0 | 10.5 | 14.5 | 13,392 | 16,702 | 17,713 |
| Luxemburg..... | 16,500 | 12,056 | 12,056 | 12,740 | 19.7 | 17.5 | 21.1 | 21.7 | 260,774 | 276,128 | 281,285 |
| France..... | 9,547 | 10,890 | 10,460 | 10,478 | 13.7 | 13.6 | 13.4 | 11.4 | 142,420 | 144,825 | 149,266 |
| Spain..... | 1,211 | 1,078 | 1,102 | 1,137 | 4.8 | 10.3 | 10.8 | 6.8 | 130,446 | 111,447 | 111,110 |
| Portugal..... | 11,793 | 12,294 | 12,294 | 11,803 | 13.0 | 17.2 | 15.9 | 18.6 | 184,393 | 195,809 | 228,596 |
| Italy..... | 105 | 127 | 127 | 11,803 | 31.0 | 30.1 | 32.4 | 33.6 | 3,314 | 4,119 | 4,270 |
| Switzerland..... | 4,029 | 4,321 | 4,270 | 3,964 | 32.9 | 27.3 | 27.0 | 33.2 | 131,274 | 120,522 | 141,593 |
| Germany..... | 633 | 4,505 | 4,505 | 5,511 | 20.2 | 18.4 | 23.7 | 25.5 | 12,819 | 11,960 | 12,880 |
| Austria..... | 1,718 | 1,579 | 1,579 | 2,023 | 22.0 | 23.6 | 25.6 | 23.8 | 36,015 | 40,385 | 51,499 |
| Czechoslovakia..... | 3,713 | 4,021 | 4,141 | 3,913 | 19.3 | 17.8 | 19.1 | 23.0 | 71,493 | 76,933 | 99,214 |
| Hungary..... | 3,245 | 4,521 | 4,747 | 5,289 | 13.6 | 14.9 | 12.5 | 21.8 | 58,753 | 56,568 | 103,294 |
| Yugoslavia..... | 3,982 | 1,223 | 1,320 | 1,190 | 14.4 | 8.8 | 10.5 | 9.8 | 31,899 | 12,970 | 13,085 |
| Greece..... | 1,134 | 2,673 | 2,779 | 2,617 | 13.7 | 13.1 | 15.8 | 18.2 | 16,273 | 42,121 | 50,691 |
| Bulgaria..... | 2,409 | 2,300 | 2,673 | 2,764 | 16.7 | 12.7 | 12.6 | 14.6 | 31,899 | 96,734 | 115,544 |
| Rumania..... | 16,512 | 7,063 | 7,023 | 6,764 | 18.0 | 16.5 | 18.2 | 17.6 | 89,570 | 96,734 | 99,753 |
| Poland..... | 3,512 | 3,360 | 3,927 | 3,426 | 19.0 | 16.6 | 18.2 | 18.1 | 158,672 | 61,063 | 115,544 |
| Lithuania..... | 211 | 267 | 393 | 488 | 13.5 | 16.6 | 17.8 | 16.3 | 3,264 | 5,273 | 6,813 |
| Latvia..... | 85 | 145 | 164 | 145 | 17.1 | 16.0 | 18.2 | 15.2 | 1,426 | 2,636 | 2,499 |
| Estonia..... | 29 | 67 | 70 | 82 | 15.8 | 14.2 | 16.1 | 14.8 | 1,667 | 1,079 | 1,037 |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | Bushels | Bushels | Bushels | Bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |

STATISTICS OF GRAINS

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| | | | | | | | | | | | | | | | |
|---|---------|---------|---------|---------|---------|------|------|------|------|------|-----------|-----------|-----------|-----------|-----------|
| Finland..... | 8 | 36 | 44 | 46 | 47 | 17.1 | 20.5 | 24.2 | 21.7 | 23.3 | 137 | 739 | 1,064 | 998 | 1,085 |
| Russia..... | 74,209 | 42,799 | 77,238 | 68,170 | 70,000 | 10.2 | 9.8 | 9.7 | 11.5 | | 758,941 | 419,259 | 751,920 | 783,224 | |
| Estimated European total, ex- cluding Russia..... | 72,800 | 66,000 | 71,000 | 71,000 | 70,000 | | | | | | 1,348,000 | 1,194,000 | 1,288,000 | 1,408,000 | 1,415,000 |
| AFRICA | | | | | | | | | | | | | | | |
| Morocco..... | (1,700) | 2,272 | 2,304 | 2,665 | 2,843 | | 9.6 | 10.7 | 9.3 | 9.5 | (17,000) | 21,758 | 24,618 | 24,746 | 26,885 |
| Algeria..... | 3,521 | 3,416 | 3,469 | 3,636 | 3,722 | | 7.8 | 8.2 | 8.3 | 8.8 | 35,161 | 26,647 | 28,323 | 30,302 | 32,833 |
| Tunis..... | 1,310 | 1,402 | 1,408 | 2,011 | 1,730 | 10.0 | 3.6 | 5.9 | 6.0 | 7.1 | 6,224 | 7,892 | 8,267 | 12,125 | 12,309 |
| Egypt..... | 1,314 | 1,462 | 1,655 | 1,580 | 1,614 | 25.6 | 25.2 | 26.8 | 23.5 | 28.0 | 33,662 | 36,806 | 44,347 | 37,286 | 45,228 |
| ASIA | | | | | | | | | | | | | | | |
| Cyprus..... | 162 | 191 | 171 | 168 | | 13.7 | 12.0 | 14.0 | 9.3 | | 2,216 | 2,292 | 2,390 | 1,537 | |
| India..... | 29,224 | 29,560 | 31,303 | 32,193 | 32,011 | 12.0 | 11.4 | 10.7 | 9.0 | 9.9 | 351,841 | 336,269 | 384,992 | 290,864 | 317,595 |
| Japanese Empire: | | | | | | | | | | | | | | | |
| Japan..... | 1,179 | 1,197 | 1,161 | 1,201 | 1,214 | 21.3 | 23.9 | 26.7 | 25.7 | 25.1 | 28,088 | 28,553 | 31,018 | 30,812 | 30,496 |
| Korea..... | 374 | 882 | 897 | 896 | 875 | 12.0 | 11.6 | 10.1 | 9.6 | 9.5 | 6,898 | 10,208 | 9,043 | 8,595 | 8,319 |
| Formosa..... | 15 | 7 | 1 | 1 | 1 | 11.3 | 9.1 | 14.0 | 15.0 | | 169 | 64 | 14 | 15 | |
| Kwantung..... | 34 | 4 | 4 | 4 | | 10.0 | 11.8 | 9.8 | 8.0 | | 340 | 47 | 39 | 32 | |
| Estimated Asiatic total exclud- ing Russia and China..... | 37,600 | 37,900 | 40,300 | 39,000 | 39,000 | | | | | | 419,000 | 447,000 | 455,000 | 369,000 | 425,000 |
| Estimated Northern Hemi- sphere total excluding Russia and China..... | 177,500 | 195,100 | 202,900 | 204,100 | 206,200 | | | | | | 2,759,000 | 2,917,000 | 3,200,000 | 3,376,000 | 3,072,000 |
| SOUTHERN HEMISPHERE | | | | | | | | | | | | | | | |
| Brazil..... | 1,003 | 1,224 | 330 | | | | | | | | | | | | |
| Chile..... | 1,443 | 1,443 | 1,530 | 1,500 | | 28.9 | 21.9 | 12.7 | 18.4 | | 20,062 | 4,908 | 4,203 | 4,203 | |
| Uruguay..... | 3,791 | 867 | 1,151 | 1,256 | 1,121 | 38.2 | 17.9 | 18.5 | 11.7 | | 25,761 | 25,761 | 28,307 | 27,650 | |
| Argentina..... | 16,051 | 16,635 | 19,714 | 20,900 | 19,430 | 9.2 | 11.2 | 13.4 | 11.7 | | 3,6317 | 9,680 | 13,397 | 13,672 | |
| Union of South Africa..... | 4,803 | 5,678 | 910 | 985 | 938 | 47.5 | 12.0 | 12.1 | 14.7 | 7.4 | 147,059 | 203,388 | 239,162 | 307,360 | 143,175 |
| Southern Rhodesia..... | 3 | 3 | 3 | 3 | | | 8.6 | 7.3 | 7.0 | 11.9 | 4,634 | 7,459 | 6,644 | 6,930 | 11,203 |
| Australia..... | 7,603 | 10,010 | 12,279 | 14,584 | 14,500 | 11.9 | 6.2 | 10.7 | 7.0 | | 90,407 | 128,520 | 118,199 | 160,475 | 112,000 |
| New Zealand..... | 241 | 224 | 261 | 215 | 234 | 28.7 | 20.6 | 36.6 | 34.6 | 7.7 | 6,925 | 6,640 | 9,541 | 8,819 | |
| Estimated Southern Hemi- sphere total..... | 26,700 | 31,000 | 36,800 | 40,600 | 38,800 | | | | | | 282,000 | 390,000 | 461,000 | 567,000 | 343,000 |
| Estimated world total excluding Russia and China..... | 204,200 | 226,100 | 239,700 | 244,700 | 245,000 | | | | | | 3,041,000 | 3,307,000 | 3,661,000 | 3,943,000 | 3,415,000 |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Figures in parentheses indicate unofficial estimates. For each year is shown the harvest during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

1 Where changes in boundary have occurred, averages are estimates for territory within present boundaries.

2 2-year average.

3 4-year average.

4 1-year only.

5 3-year average.

TABLE 9.—Wheat: World production, 1890-1929

| Year | World production excluding Russia and China | Northern Hemisphere production excluding Russia and China | European production excluding Russia | Selected countries | | | | | | |
|-------------------------|---|---|--------------------------------------|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | Russia ¹ | United States | Canada | India | Argentina | Australia | France |
| | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels |
| 1890..... | 1,878 | 1,802 | 1,056 | 213 | 378 | — | 229 | 31 | 27 | 330 |
| 1891..... | 1,989 | 1,904 | 900 | 181 | 585 | — | 257 | 36 | 26 | 215 |
| 1892..... | 2,053 | 1,938 | 1,045 | 266 | 528 | — | 227 | 59 | 33 | 311 |
| 1893..... | 2,076 | 1,936 | 1,097 | 482 | 428 | — | 286 | 82 | 37 | 278 |
| 1894..... | 2,128 | 2,018 | 1,080 | 477 | 516 | — | 271 | 61 | 28 | 344 |
| 1895..... | 2,129 | 2,039 | 1,057 | 310 | 569 | — | 261 | 46 | 18 | 340 |
| 1896..... | 2,057 | 1,986 | 1,103 | 412 | 544 | — | 201 | 32 | 21 | 340 |
| 1897..... | 1,893 | 1,790 | 842 | 340 | 610 | — | 200 | 53 | 28 | 242 |
| 1898..... | 2,552 | 2,374 | 1,168 | 459 | 772 | — | 209 | 105 | 41 | 365 |
| 1899..... | 2,319 | 2,150 | 1,113 | 454 | 636 | — | 255 | 102 | 40 | 365 |
| 1900..... | 2,210 | 2,064 | 1,096 | 423 | 603 | — | 200 | 75 | 48 | 326 |
| 1901..... | 2,472 | 2,357 | 1,103 | 428 | 789 | — | 265 | 56 | 39 | 311 |
| 1902..... | 2,510 | 2,368 | 1,207 | 607 | 725 | — | 227 | 104 | 12 | 328 |
| 1903..... | 2,651 | 2,412 | 1,266 | 621 | 664 | — | 298 | 130 | 74 | 363 |
| 1904..... | 2,478 | 2,238 | 1,116 | 667 | 597 | — | 360 | 151 | 55 | 340 |
| 1905..... | 2,673 | 2,441 | 1,223 | 646 | 727 | — | 283 | 135 | 69 | 345 |
| 1906..... | 2,950 | 2,694 | 1,356 | 533 | 757 | — | 320 | 156 | 66 | 329 |
| 1907..... | 2,619 | 2,344 | 1,176 | 571 | 638 | — | 317 | 192 | 45 | 341 |
| 1908..... | 2,544 | 2,283 | 1,181 | 628 | 645 | 112 | 229 | 156 | 63 | 317 |
| 1909 ² | 2,819 | 2,554 | 1,240 | 846 | 700 | 167 | 285 | 131 | 90 | 359 |
| 1910 ² | 2,777 | 2,495 | 1,201 | 836 | 635 | 132 | 360 | 146 | 95 | 253 |
| 1911 ² | 3,043 | 2,758 | 1,347 | 563 | 621 | 231 | 376 | 166 | 72 | 322 |
| 1912 ² | 3,093 | 2,770 | 1,284 | 801 | 730 | 224 | 371 | 187 | 92 | 334 |
| 1913 ² | 3,098 | 2,853 | 1,301 | 1,028 | 763 | 232 | 368 | 105 | 103 | 319 |
| 1914..... | 2,834 | 2,601 | 1,072 | ³ 834 | 891 | 161 | 312 | 160 | 25 | 283 |
| 1915..... | 3,497 | 3,102 | 1,125 | ⁴ 827 | 1,026 | 394 | 377 | 169 | 179 | 223 |
| 1916..... | 2,734 | 2,457 | 1,049 | ⁵ 531 | 636 | 263 | 323 | 84 | 152 | 205 |
| 1917..... | 2,574 | 2,178 | 740 | 622 | 637 | 234 | 382 | 235 | 115 | ⁶ 125 |
| 1918..... | 2,911 | 2,608 | 909 | — | 921 | 189 | 370 | 180 | 76 | 229 |
| 1919..... | 2,821 | 2,517 | 899 | — | 968 | 193 | 280 | 217 | 46 | 187 |
| 1920..... | 2,948 | 2,695 | 949 | — | 833 | 263 | 378 | 156 | 146 | 237 |
| 1921..... | 3,169 | 2,787 | 1,216 | 205 | 815 | 301 | 250 | 191 | 129 | 323 |
| 1922..... | 3,225 | 2,868 | 1,044 | 243 | 868 | 400 | 367 | 196 | 109 | 243 |
| 1923..... | 3,551 | 3,119 | 1,257 | 419 | 797 | 474 | 372 | 248 | 125 | 276 |
| 1924..... | 3,150 | 2,737 | 1,058 | 472 | 864 | 262 | 361 | 191 | 165 | 281 |
| 1925..... | 3,441 | 3,073 | 1,397 | 757 | 676 | 395 | 331 | 191 | 115 | 380 |
| 1926..... | 3,426 | 2,984 | 1,210 | 889 | 831 | 407 | 325 | 221 | 161 | 232 |
| 1927..... | 3,661 | 3,200 | 1,268 | 752 | 878 | 490 | 335 | 239 | 118 | 276 |
| 1928..... | 3,943 | 3,376 | 1,409 | 783 | 915 | 567 | 291 | 307 | 160 | 281 |
| 1929..... | 3,415 | 3,072 | 1,415 | — | 807 | 294 | 318 | 149 | 112 | 320 |

Bureau of Agricultural Economics. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

¹ Includes all Russian territory reporting for years named.

² The average production for the 1909-1913 period as computed from figures given here for estimated world total, Northern Hemisphere total, European total, and European countries whose boundaries were changed by the World War will not agree with estimates appearing elsewhere for present territory, due to changes in boundary.

³ Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.

⁴ Exclusive of Russian Poland, Lithuania, parts of present Latvia and Ukraine, and 2 Provinces of Transcaucasia.

⁵ Beginning with this date estimated production is within present boundaries of the Union of Socialist Soviet Republics, excluding Turkestan, Transcaucasia, and the Far East, which regions in 1924 produced 51,706,000 bushels, and in 1925, 58,000,000 bushels.

⁶ Beginning with this date production is within postwar boundaries and therefore not comparable with earlier years.

⁷ Preliminary.

TABLE 10.—Wheat: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917-1928

| Year beginning July | Percentage of year's receipts | | | | | | | | | | | | | Season |
|------------------------|-------------------------------|------|-------|------|------|------|------|------|------|------|-----|------|-------|--------|
| | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | | |
| 1917 | 7.4 | 12.4 | 19.3 | 18.0 | 13.7 | 7.6 | 4.7 | 3.9 | 3.7 | 4.1 | 3.1 | 2.1 | 100.0 | |
| 1918 | 17.6 | 19.9 | 18.0 | 13.8 | 8.7 | 7.3 | 4.6 | 3.1 | 2.0 | 1.6 | 1.9 | 1.5 | 100.0 | |
| 1919 | 17.1 | 23.2 | 15.6 | 11.1 | 7.5 | 5.7 | 4.2 | 3.0 | 2.9 | 3.1 | 3.4 | 3.2 | 100.0 | |
| 1920 | 12.1 | 14.3 | 15.9 | 10.6 | 6.0 | 6.2 | 5.5 | 5.3 | 4.9 | 5.0 | 6.4 | 6.9 | 100.0 | |
| 1921 | 19.1 | 18.2 | 16.4 | 10.6 | 6.8 | 5.4 | 4.4 | 4.9 | 3.9 | 3.2 | 3.5 | 3.6 | 100.0 | |
| 1922 | 14.8 | 17.3 | 14.2 | 12.0 | 8.6 | 7.4 | 5.5 | 5.1 | 4.3 | 3.7 | 3.4 | 3.7 | 100.0 | |
| 1923 | 13.4 | 17.6 | 10.7 | 13.7 | 9.5 | 6.2 | 4.6 | 4.8 | 3.3 | 2.9 | 3.7 | 3.6 | 100.0 | |
| 1924 | 13.6 | 19.8 | 17.5 | 14.5 | 8.6 | 5.6 | 5.3 | 4.2 | 2.5 | 1.6 | 3.1 | 3.7 | 100.0 | |
| 1925 | 14.6 | 18.6 | 18.7 | 10.9 | 8.6 | 7.0 | 4.7 | 4.0 | 3.0 | 3.0 | 2.9 | 4.0 | 100.0 | |
| 1926 | 21.8 | 20.3 | 13.2 | 10.0 | 5.8 | 5.0 | 4.6 | 4.6 | 3.6 | 2.4 | 3.2 | 5.5 | 100.0 | |
| 1927 | 15.4 | 18.6 | 19.6 | 12.6 | 7.7 | 5.6 | 4.5 | 4.1 | 3.8 | 2.5 | 2.5 | 3.1 | 100.0 | |
| 1928 | 17.9 | 18.6 | 17.0 | 11.6 | 7.0 | 5.4 | 3.8 | 4.3 | 3.4 | 2.5 | 2.6 | 5.9 | 100.0 | |

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TABLE 11.—Wheat: Stocks and shipments, United States, 1909-1929

| Year beginning July | Stocks of old wheat on farms July 1 ¹ | Stocks of old wheat in country mills and elevators July 1 ² | Merchant mill stocks July 1 ³ | Commercial visible stocks end of week nearest July 1 ⁴ | Weight per measured bushel of new wheat ⁵ | Stocks of wheat on farms on Mar. 1 following ⁶ | Stocks of wheat in country mills and elevators on Mar. 1 following ⁷ | Shipped out of country where grown ⁸ |
|---------------------|--|--|--|---|--|---|---|---|
| | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | Pounds | 1,000 bush. | 1,000 bush. | 1,000 bush. |
| 1909 | 14, 171 | — | — | — | 57.9 | 163, 371 | — | 428, 262 |
| 1910 | 36, 725 | — | — | — | 58.5 | 162, 705 | 98, 597 | 352, 906 |
| 1911 | 34, 071 | — | — | — | 57.8 | 122, 041 | 95, 710 | 348, 739 |
| 1912 | 23, 876 | — | — | — | 58.3 | 156, 471 | 118, 400 | 449, 881 |
| 1913 | 35, 515 | — | — | — | 58.7 | 151, 795 | 93, 627 | 411, 733 |
| 1914 | 32, 236 | — | — | — | 58.0 | 152, 903 | 85, 955 | 541, 198 |
| 1915 | 28, 972 | — | — | — | 57.9 | 244, 448 | 155, 027 | 633, 380 |
| 1916 | 74, 731 | — | — | — | 57.1 | 100, 650 | 89, 173 | 361, 088 |
| 1917 | 15, 611 | — | — | — | 58.5 | 107, 745 | 66, 138 | 325, 500 |
| 1918 | 8, 063 | — | — | — | 58.8 | 128, 703 | 107, 037 | 541, 666 |
| 1919 | 19, 261 | 19, 672 | — | — | 56.3 | 169, 904 | 123, 233 | 591, 552 |
| 1920 | 49, 546 | 37, 304 | — | — | 57.4 | 217, 037 | 87, 075 | 491, 035 |
| 1921 | 56, 707 | 27, 167 | — | — | 57.0 | 134, 253 | 75, 071 | 502, 470 |
| 1922 | 32, 359 | 28, 756 | — | — | 57.7 | 156, 087 | 102, 908 | 584, 089 |
| 1923 | 35, 894 | 37, 117 | — | — | 57.4 | 137, 721 | 98, 284 | 505, 792 |
| 1924 | 30, 981 | 36, 626 | — | — | 58.9 | 112, 095 | 67, 673 | 530, 819 |
| 1925 | 29, 357 | 26, 287 | — | — | 58.3 | 100, 174 | 76, 376 | 483, 741 |
| 1926 | 20, 982 | 29, 501 | 22, 447 | — | 59.1 | 130, 274 | 85, 928 | 580, 351 |
| 1927 | 27, 222 | 21, 776 | 34, 149 | 21, 888 | 58.5 | 130, 944 | 75, 428 | 504, 525 |
| 1928 | 23, 729 | 19, 277 | 29, 782 | 38, 587 | 58.5 | 161, 396 | 78, 411 | 672, 002 |
| 1929 ⁹ | 45, 483 | 40, 136 | 45, 914 | 79, 442 | 58.2 | — | — | — |

Bureau of Agricultural Economics. Prior to 1918 stocks in mills and elevators not included.

¹ Based on percentage of crop on farms as estimated by crop reporters.² Based on percentage of crop as estimated by about 3,500 mill and elevator operators.³ Stocks in mills and attached mill elevators reporting to Bureau of the Census.⁴ Domestic grain in store and afloat at United States markets.⁵ Based on estimates of crop reporters on Nov. 1.⁶ Based on percentage shipped out as estimated by crop reporters.⁷ Revised.⁸ Preliminary.

TABLE 12.—Wheat: Receipts inspected, by markets, 1917–1928

| Market | Year beginning July | | | | | | | | | | | |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
| | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| Minneapolis..... | 90,311 | 123,119 | 127,145 | 119,107 | 109,401 | 126,508 | 99,368 | 76,960 | 118,730 | 85,466 | 129,966 | 119,605 |
| Duluth..... | 23,481 | 113,911 | 16,611 | 50,194 | 55,995 | 71,154 | 38,460 | 102,654 | 67,447 | 49,985 | 98,032 | 89,357 |
| Kansas City..... | 24,848 | 69,182 | 110,694 | 115,200 | 126,025 | 77,302 | 59,948 | 86,713 | 51,571 | 90,535 | 74,595 | 101,190 |
| Chicago..... | 12,146 | 73,446 | 62,244 | 22,190 | 45,483 | 39,207 | 43,017 | 59,831 | 19,058 | 30,811 | 34,592 | 25,827 |
| St. Louis..... | 17,120 | 43,001 | 43,685 | 27,109 | 32,262 | 27,254 | 26,859 | 26,909 | 25,148 | 26,247 | 24,423 | 34,714 |
| Omaha..... | 10,829 | 24,066 | 30,031 | 31,031 | 30,140 | 28,760 | 19,763 | 31,690 | 16,903 | 21,642 | 30,008 | 34,689 |
| Wichita..... | 7,000 | 15,332 | 21,100 | 16,363 | 25,186 | 21,185 | 22,151 | 29,559 | 18,972 | 28,166 | 21,191 | 30,584 |
| Portland, Oreg..... | 5,957 | 10,612 | 12,468 | 28,842 | 36,566 | 22,395 | 36,732 | 21,559 | 27,892 | 35,299 | 42,931 | 27,612 |
| New York..... | 22,950 | 49,990 | 28,821 | 52,750 | 33,136 | 27,368 | 9,186 | 21,978 | 6,334 | 33,855 | 45,066 | 41,102 |
| Philadelphia..... | 8,180 | 34,713 | 23,816 | 19,564 | 17,598 | 36,893 | 6,252 | 18,236 | 5,767 | 6,933 | 4,026 | 1,378 |
| Baltimore..... | 6,434 | 25,724 | 24,522 | 25,653 | 12,817 | 13,434 | 16,480 | 14,286 | 13,862 | 21,204 | 13,904 | 17,854 |
| New Orleans..... | 2,710 | 16,409 | 15,678 | 67,483 | 30,325 | 24,628 | 6,261 | 32,630 | 2,235 | 8,908 | 7,622 | 5,810 |
| Galveston..... | 1,996 | 10,128 | 26,042 | 73,334 | 44,126 | 17,400 | 7,055 | 33,953 | 2,769 | 44,781 | 11,332 | 16,672 |
| All other inspection points..... | 111,858 | 200,241 | 236,976 | 204,418 | 242,466 | 224,418 | 213,715 | 256,192 | 201,036 | 308,383 | 260,728 | 346,593 |
| Total..... | 345,820 | 809,874 | 785,833 | 853,238 | 841,586 | 757,906 | 605,245 | 813,120 | 577,724 | 792,215 | 798,446 | 892,887 |

Bureau of Agricultural Economics. Compiled from reports of licensed inspectors through district offices of Federal grain supervision.

TABLE 13.—Wheat: Receipts inspected, all inspection points, by classes, 1925–1928

| Class and year beginning July | Grade | | | | | | Total |
|-------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | Sample | |
| | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| Hard red spring: | | | | | | | |
| 1925..... | 86,832 | 36,280 | 28,471 | 14,683 | 5,042 | 5,173 | 176,481 |
| 1926..... | 51,160 | 29,373 | 23,823 | 17,677 | 4,114 | 10,706 | 136,853 |
| 1927..... | 106,285 | 56,839 | 41,268 | 18,763 | 6,200 | 11,939 | 241,204 |
| 1928..... | 110,602 | 36,986 | 22,562 | 8,462 | 4,625 | 40,812 | 224,049 |
| Durum: | | | | | | | |
| 1925..... | 9,733 | 28,610 | 7,975 | 4,272 | 686 | 1,568 | 52,844 |
| 1926..... | 2,405 | 10,548 | 6,548 | 7,764 | 1,395 | 4,403 | 33,063 |
| 1927..... | 11,331 | 31,170 | 9,692 | 5,667 | 2,147 | 2,414 | 62,321 |
| 1928..... | 5,248 | 33,789 | 14,652 | 9,169 | 5,478 | 5,508 | 73,844 |
| Hard red winter: | | | | | | | |
| 1925..... | 51,498 | 92,972 | 33,812 | 9,239 | 3,918 | 3,143 | 194,582 |
| 1926..... | 201,893 | 145,602 | 31,067 | 10,084 | 7,821 | 10,978 | 407,445 |
| 1927..... | 100,264 | 123,475 | 41,434 | 19,331 | 11,127 | 14,664 | 310,295 |
| 1928..... | 141,045 | 168,205 | 69,541 | 28,330 | 18,914 | 16,836 | 442,871 |
| Soft red winter: | | | | | | | |
| 1925..... | 8,309 | 30,939 | 10,273 | 2,877 | 1,249 | 1,463 | 55,110 |
| 1926..... | 35,810 | 40,147 | 11,656 | 7,903 | 2,881 | 6,011 | 104,408 |
| 1927..... | 10,563 | 25,795 | 13,659 | 7,942 | 2,305 | 3,371 | 63,635 |
| 1928..... | 8,317 | 15,866 | 7,416 | 4,924 | 1,654 | 3,967 | 42,134 |
| White: | | | | | | | |
| 1925..... | 5,091 | 20,435 | 11,816 | 3,840 | 649 | 543 | 42,374 |
| 1926..... | 10,981 | 25,696 | 8,215 | 1,999 | 423 | 659 | 47,973 |
| 1927..... | 17,822 | 25,819 | 8,733 | 3,072 | 1,370 | 3,492 | 60,808 |
| 1928..... | 17,412 | 19,438 | 2,791 | 650 | 228 | 322 | 40,841 |
| Mixed: | | | | | | | |
| 1925..... | 15,119 | 24,019 | 10,115 | 4,017 | 1,533 | 1,530 | 56,333 |
| 1926..... | 15,877 | 20,626 | 10,011 | 7,340 | 2,597 | 6,022 | 62,473 |
| 1927..... | 14,807 | 22,624 | 12,042 | 5,570 | 2,453 | 3,097 | 60,593 |
| 1928..... | 14,150 | 23,338 | 13,111 | 8,595 | 5,621 | 4,533 | 69,148 |
| Total: | | | | | | | |
| 1925..... | 176,582 | 233,255 | 102,462 | 38,928 | 13,077 | 13,420 | 577,724 |
| 1926..... | 318,126 | 271,992 | 91,320 | 52,767 | 19,231 | 38,779 | 792,215 |
| 1927..... | 261,072 | 285,722 | 126,828 | 60,245 | 25,602 | 28,977 | 798,446 |
| 1928..... | 296,774 | 297,612 | 130,073 | 59,930 | 36,520 | 71,978 | 892,887 |

Bureau of Agricultural Economics. Compiled from reports of licensed inspectors through district offices of Federal grain supervision. See 1927, p. 752, Yearbook for data for earlier years.

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TABLE 14.—Wheat: Visible supply in the United States,¹ 1909–1929

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June |
|---------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1909..... | 12,771 | 12,611 | 15,514 | 28,589 | 37,820 | 41,688 | 37,949 | 36,638 | 34,461 | 37,558 | 33,771 | 24,795 |
| 1910..... | 16,396 | 17,053 | 38,352 | 48,437 | 53,420 | 67,002 | 59,369 | 56,357 | 50,566 | 42,697 | 34,656 | 32,769 |
| 1911..... | 29,639 | 46,389 | 54,581 | 61,500 | 73,792 | 81,215 | 81,501 | 70,748 | 66,082 | 59,826 | 48,022 | 35,994 |
| 1912..... | 27,615 | 23,595 | 26,862 | 40,998 | 52,494 | 67,575 | 77,471 | 76,131 | 73,895 | 69,000 | 53,508 | 43,687 |
| 1913..... | 34,420 | 43,198 | 51,980 | 61,485 | 66,863 | 72,061 | 74,854 | 71,264 | 66,191 | 59,931 | 49,327 | 33,662 |
| 1914..... | 17,136 | 36,456 | 39,964 | 61,784 | 76,262 | 86,332 | 85,957 | 81,776 | 58,923 | 46,287 | 31,407 | 22,871 |
| 1915..... | 10,734 | 9,361 | 12,679 | 22,498 | 33,338 | 60,678 | 80,150 | 77,834 | 73,748 | 66,691 | 57,658 | 52,512 |
| 1916..... | 50,515 | 49,591 | 65,754 | 70,420 | 75,455 | 76,191 | 73,584 | 59,477 | 54,160 | 48,525 | 32,831 | 34,876 |
| 1917..... | 19,901 | 11,692 | 10,315 | 13,072 | 22,855 | 29,633 | 26,476 | 20,436 | 15,484 | 10,180 | 6,656 | 4,379 |
| 1918..... | 2,465 | 20,462 | 54,236 | 98,155 | 131,852 | 131,584 | 129,627 | 140,607 | 127,207 | 100,505 | 55,247 | 27,626 |
| 1919..... | 10,873 | 25,968 | 65,479 | 95,550 | 107,783 | 101,058 | 85,117 | 68,494 | 58,632 | 51,909 | 47,756 | 41,233 |
| 1920..... | 23,404 | 20,226 | 24,195 | 32,169 | 41,596 | 48,273 | 47,797 | 38,475 | 31,945 | 22,229 | 17,584 | 10,598 |
| 1921..... | 9,966 | 28,727 | 47,159 | 62,758 | 62,767 | 53,507 | 56,776 | 48,802 | 46,714 | 42,287 | 36,644 | 31,497 |
| 1922..... | 20,342 | 23,077 | 32,479 | 38,025 | 39,023 | 39,764 | 43,856 | 53,823 | 54,562 | 51,862 | 49,521 | 37,303 |
| 1923..... | 29,403 | 40,526 | 63,922 | 72,930 | 79,034 | 82,269 | 84,030 | 75,111 | 72,914 | 66,730 | 50,383 | 48,686 |
| 1924..... | 38,597 | 46,193 | 79,700 | 92,353 | 100,712 | 108,997 | 99,121 | 84,476 | 76,437 | 62,766 | 49,529 | 38,328 |
| 1925..... | 29,285 | 34,041 | 39,800 | 56,639 | 52,394 | 62,686 | 59,244 | 52,730 | 48,105 | 38,173 | 33,798 | 23,170 |
| 1926..... | 16,486 | 34,575 | 72,884 | 84,724 | 81,175 | 78,910 | 70,811 | 62,317 | 61,271 | 53,827 | 42,402 | 31,115 |
| 1927..... | 25,516 | 37,533 | 71,908 | 88,755 | 98,675 | 100,013 | 94,336 | 83,720 | 77,949 | 73,220 | 66,184 | 52,460 |
| 1928..... | 42,208 | 66,762 | 96,798 | 118,327 | 143,003 | 145,234 | 146,813 | 133,759 | 130,034 | 128,339 | 116,559 | 999,906 |
| 1929..... | 95,684 | 145,504 | 196,886 | 205,778 | 209,428 | 198,557 | | | | | | |

Bureau of Agricultural Economics. Compiled from Bradstreet's. Includes grain stored at approximately 50 interior and seaboard points of accumulation and grain in transit by canals and lakes; also Pacific coast stocks at Portland, Tacoma, and Seattle.

¹ Saturday nearest the 1st of each month.

TABLE 15.—Wheat: Commercial stocks in store, 1926–27 to 1929–30

DOMESTIC WHEAT IN UNITED STATES¹

| | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June |
|--------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1926–27..... | | | | | | | 66,340 | 56,303 | 56,292 | 49,910 | 37,997 | 27,833 |
| 1927–28..... | 21,052 | 33,677 | 62,042 | 78,811 | 80,684 | 91,589 | 88,581 | 79,152 | 72,858 | 68,791 | 61,457 | 48,286 |
| 1928–29..... | 38,587 | 52,421 | 93,870 | 115,469 | 139,493 | 140,172 | 144,351 | 129,646 | 126,377 | 124,756 | 113,392 | 96,059 |
| 1929–30..... | 90,442 | 136,423 | 186,847 | 198,211 | 202,461 | 198,926 | | | | | | |

UNITED STATES WHEAT IN CANADA

| 1926–27..... | | | | | | | 1,067 | 549 | 437 | 378 | 746 | 1,344 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1927–28..... | 1,362 | 1,290 | 4,249 | 4,560 | 7,258 | 5,156 | 3,933 | 2,285 | 1,640 | 977 | 863 | 2,314 |
| 1928–29..... | 2,506 | 2,258 | 2,546 | 3,295 | 8,602 | 8,280 | 7,328 | 3,930 | 2,139 | 1,586 | 1,738 | 4,865 |
| 1929–30..... | 3,332 | 2,288 | 4,450 | 8,770 | 9,065 | 9,101 | | | | | | |

CANADIAN WHEAT IN UNITED STATES¹

| 1926–27..... | | | | | | | 23,394 | 14,500 | 9,532 | 6,650 | 10,724 | 16,749 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1927–28..... | 7,472 | 4,835 | 3,410 | 3,784 | 8,617 | 31,375 | 35,764 | 28,703 | 19,260 | 11,848 | 6,597 | 11,549 |
| 1928–29..... | 11,132 | 13,605 | 3,789 | 7,548 | 18,291 | 33,902 | 46,717 | 38,327 | 32,851 | 23,854 | 28,772 | 25,538 |
| 1929–30..... | 23,196 | 23,550 | 22,025 | 21,753 | 28,310 | 34,527 | | | | | | |

Bureau of Agricultural Economics. Compiled from weekly reports to the Grain, Hay and Feed Market News Service. Data are for stocks on the Saturday nearest the 1st day of the month.

¹ Includes wheat in store in public and private elevators in 39 important markets and also the wheat afloat in vessels or barges in the harbors of lake and seaboard ports. Wheat in transit either by rail or water, mill stocks, or small private stocks of wheat intended only for local purposes, not included.

² Includes wheat stored at lake and seaboard ports, exclusive of wheat in transit on lakes and canals.

TABLE 16.—Wheat: Supply and distribution and per capita disappearance in the United States averages 1899–1925, annual 1926–1929

| Item | Year beginning July | | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | Average 1899–1908 | Average 1909–1918 | Average 1911–1920 | Average 1921–1925 | 1926 | 1927 | 1928 | 1929 |
| Supply: | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| Stocks on farms, July 1 ¹ | 46,423 | 28,872 | 32,631 | 37,059 | 20,962 | 27,222 | 23,729 | 45,483 |
| Stocks in country mills and elevators, July 1 ² | 27,000 | 20,000 | 26,997 | 30,991 | 29,501 | 21,776 | 19,277 | 40,136 |
| Commercial visible (Bradstreet's) July 1 | 31,817 | 24,168 | 19,290 | 25,519 | 16,466 | 25,516 | 42,208 | 95,084 |
| Stocks of flour (in terms of wheat) July 1 ² | 7,709 | 8,305 | 8,606 | 8,676 | 9,757 | 9,076 | 9,019 | 13,541 |
| In merchant mills and elevators ³ | | | | | 24,505 | 37,038 | 31,920 | 43,279 |
| In transit to commercial mills ³ | | | | | 7,350 | 11,274 | 10,893 | 16,237 |
| New crop ⁴ | 677,927 | 690,108 | 844,605 | 804,148 | 831,040 | 878,374 | 914,876 | 806,508 |
| Imports (flour included) July 1 to June 30 ⁴ | 733 | 1,834 | 19,806 | 17,473 | 13,294 | 15,734 | 21,442 | |
| Total supply | 791,629 | 782,287 | 951,935 | 923,866 | 952,885 | 1,026,010 | 1,073,364 | |
| Distribution: | | | | | | | | |
| Exports (flour included) July 1 to June 30 ⁴ | 156,435 | 107,103 | 257,030 | 207,237 | 219,160 | 206,259 | 163,670 | |
| Reexports July 1 to June 30 ⁴ | 399 | 195 | 502 | 221 | 98 | 53 | 55 | |
| Shipments (flour included) to Alaska, Hawaii, and Porto Rico ⁴ | 2,034 | 2,549 | 2,596 | 2,836 | 3,082 | 2,690 | 3,172 | |
| Estimated seed requirements ⁶ | 70,444 | 72,326 | 88,312 | 86,849 | 88,919 | 95,739 | 88,043 | |
| Carryover on June 30— | | | | | | | | |
| On farms ¹ | 40,654 | 32,485 | 36,127 | 29,912 | 27,222 | 23,729 | 45,483 | |
| In country mills and elevators ³ | 25,400 | 31,600 | 26,449 | 31,457 | 21,776 | 19,277 | 40,136 | |
| Commercial visible (Bradstreet's) | 28,668 | 25,326 | 18,265 | 26,822 | 25,516 | 42,208 | 95,084 | |
| Flour (in terms of wheat) ² | 7,374 | 8,935 | 8,290 | 9,240 | 9,076 | 9,019 | 13,541 | |
| In merchant mills and elevators ³ | | | | | 37,038 | 31,920 | 48,279 | |
| In transit to commercial mills ³ | | | | | 11,274 | 10,893 | 16,237 | |
| Accounted for distribution | 331,408 | 280,519 | 437,581 | 394,575 | 443,161 | 441,787 | 514,300 | |
| Disappearance including food and feed | 460,221 | 501,768 | 514,354 | 529,291 | 509,724 | 584,223 | 559,064 | |
| Population, Jan. 1 (thousands) ⁷ | 82,614 | 91,378 | 102,890 | 112,696 | 117,832 | 119,320 | (⁸) | |
| Per capita disappearance, including food and feed, bushels | 5.6 | 5.3 | 5.0 | 4.7 | 4.3 | 4.9 | | |

Bureau of Agricultural Economics. Compiled as follows:

¹ Based on returns to the bureau from crop reporters.² From Chicago Daily Trade Bulletin. Stocks in country mills and elevators, from 1899–1918 are stocks in second hands less visible supply on July 1, as given by Chicago Daily Trade Bulletin; subsequently same as Note 1.³ Bureau of the Census figures raised to represent all merchant mills.⁴ From reports of Foreign and Domestic Commerce of the United States.⁵ Seven years' average.⁶ Amount of seed used per acre from returns to the bureau from inquiries sent to crop reporters.⁷ Bureau of the Census.⁸ No official figure available.

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TABLE 17.—Wheat: Production, inspections for exports, and weighted average price per bushel of representative grades by classes, 1923-1929

| Year beginning July | Estimated production ¹ | | | | | | | |
|---|-----------------------------------|---------------|-----------------|-----------------|--------------------|--------------------|----------------|--------------------------|
| | Hard red spring | Durum | Hard red winter | Soft red winter | White ² | Mixed ³ | Flour as wheat | Other wheat ⁴ |
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1923 | 126,876 | 55,269 | 241,851 | 271,631 | 101,767 | ----- | ----- | 797,394 |
| 1924 | 192,341 | 66,105 | 364,662 | 189,441 | 51,879 | ----- | ----- | 864,428 |
| 1925 | 156,053 | 65,008 | 205,799 | 169,792 | 79,777 | ----- | ----- | 676,429 |
| 1926 | 120,834 | 47,478 | 360,440 | 228,886 | 73,402 | ----- | ----- | 831,040 |
| 1927 | 201,927 | 83,162 | 317,042 | 180,887 | 95,356 | ----- | ----- | 878,374 |
| 1928 | 208,071 | 102,286 | 384,014 | 139,665 | 85,840 | ----- | ----- | 914,876 |
| 1929 | 140,176 | 56,924 | 341,069 | 189,831 | 78,508 | ----- | ----- | 806,508 |
| Inspections of United States wheat for export | | | | | | | | |
| 1923 | 1,022 | 4,008 | 19,640 | 9,810 | 18,653 | 5,435 | 81,087 | 150,880 |
| 1924 | 16,760 | 5,945 | 90,840 | 6,944 | 10,063 | 9,386 | 65,313 | 260,807 |
| 1925 | 3,338 | 4,170 | 7,858 | 2,282 | 16,914 | 5,944 | 44,846 | 108,035 |
| 1926 | 1,829 | 611 | 66,874 | 20,980 | 26,615 | 1,898 | 62,910 | 219,160 |
| 1927 | 5,209 | 3,496 | 41,603 | 9,915 | 28,150 | 1,874 | 60,260 | 206,259 |
| 1928 | 1,766 | 1,045 | 30,660 | 2,782 | 14,710 | 1,473 | 60,556 | 163,670 |
| Average price per bushel ⁵ | | | | | | | | |
| 1923 | Cents 124 | Cents 196 | Cents 105 | Cents 107 | ----- | ----- | ----- | ----- |
| 1924 | 158 | 156 | 135 | 159 | ----- | ----- | ----- | ----- |
| 1925 | 165 | 144 | 163 | 169 | ----- | ----- | ----- | ----- |
| 1926 | 151 | 155 | 135 | 138 | ----- | ----- | ----- | ----- |
| 1927 | 141 | 132 | 135 | 149 | ----- | ----- | ----- | ----- |
| 1928 | 126 | 113 | 112 | 139 | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Estimated production by classes based on questionnaire surveys of local authorities; supplemented by judgment of cereal specialists. Inspections of United States wheat for export data furnished monthly by Federal grain supervision officers at the export markets. Inspections are made at the ports of export.

¹ Production estimates are based on the estimate of percentage classification by States as reported for 1920, 1923, and 1924; the percentages for 1921 and 1922 were interpolated from the 1920 and 1923 percentages. The estimated production for 1928 and 1929 is subject to revision.

² White wheat in the Pacific Northwest region consists of both spring and winter wheat; no attempt has been made to classify this wheat as other than white wheat, part of which is spring and part winter.

³ Mixed wheats exported from Atlantic coast ports are estimated as approximately 70 per cent durum and the remainder as hard red spring; that exported from Gulf ports as approximately half and half hard and soft winter; and that exported from Pacific coast ports as approximately 90 per cent white and the remainder as hard and soft red winter wheats.

⁴ Exports of wheat other than reported as "Federal inspected" including exports through Canada. These exports are not "Federal inspected" and are exported largely through the customs districts of Buffalo, Chicago, Duluth and Superior, Wisconsin, and Ohio.

⁵ The representative grades and markets selected are No. 1 dark northern spring, Minneapolis; No. 2 amber durum, Minneapolis; No. 2 hard winter, Kansas City; and No. 2 red winter, St. Louis.

TABLE 18.—Wheat, including flour: International trade, average 1910-1914, annual 1926-1929

| Country | Year ended June 30 | | | | | | | | | |
|--------------------------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Average 1910-1914 | | 1926 | | 1927 | | 1928 | | 1929 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| Canada..... | 447 | 94, 286 | 372 | 320, 649 | 408 | 301, 948 | 476 | 308, 658 | — | 422, 732 |
| United States..... | 1, 808 | 104, 967 | 15, 679 | 108, 035 | 13, 264 | 219, 160 | 15, 734 | 200, 259 | 21, 442 | 163, 687 |
| Argentina..... | 13 | 85, 220 | 15 | 99, 803 | 14 | 138, 240 | 2 | 178, 135 | 215, 603 | — |
| Australia..... | 17 | 149, 732 | 3 | 77, 234 | 4 | 96, 584 | — | 72, 902 | — | 113, 285 |
| British India..... | 332 | 50, 821 | 1, 777 | 9, 618 | 2, 899 | 12, 598 | 2, 310 | 15, 668 | 27, 417 | 5, 678 |
| Hungary..... | ¹ 7, 214 | ³ 40, 116 | 34 | 19, 345 | 1 | 21, 143 | 2 | 22, 135 | 1 | 23, 658 |
| Russia..... | ³ 556 | ³ 164, 862 | 0 | 27, 085 | 0 | 49, 202 | — | — | — | — |
| Yugoslavia..... | 0 | 0 | 0 | 11, 549 | — | 10, 029 | — | 1, 024 | 27 | 7, 919 |
| Rumania..... | ³ 196 | 54, 630 | 280 | 8, 558 | ¹ 1 | 11, 038 | ³ 0 | 7, 431 | — | — |
| Algeria..... | ³ 639 | ³ 5, 936 | ³ 1, 182 | 6, 007 | ³ 3, 584 | 2, 182 | ³ 1, 597 | 6, 351 | — | — |
| Chile..... | ¹ 170 | ¹ 2, 593 | 731 | 1, 696 | 758 | 516 | 622 | 585 | — | — |
| Tunis..... | ³ 1, 746 | ³ 960 | 611 | 3, 437 | 1, 142 | 1, 970 | 1, 127 | 629 | — | — |
| Bulgaria..... | ³ 0 | ³ 11, 182 | ³ 5 | 4, 128 | ³ 1 | 2, 236 | — | 2, 125 | — | — |
| Spain..... | 6, 009 | 71 | 1, 466 | 683 | 56 | 985 | — | — | — | — |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 219, 474 | 4, 493 | 201, 313 | 13, 420 | 226, 908 | 10, 292 | 222, 270 | 11, 181 | 215, 140 | 11, 158 |
| Italy..... | 56, 431 | 3, 637 | 66, 339 | 2, 469 | 88, 184 | 1, 034 | 87, 796 | 1, 111 | — | — |
| Germany..... | 91, 851 | 23, 300 | 76, 410 | 20, 252 | 99, 252 | 5, 735 | 98, 557 | 6, 708 | 86, 162 | 17, 669 |
| France..... | 44, 081 | 1, 250 | 35, 978 | 1, 955 | 53, 878 | 5, 592 | 53, 987 | 132 | 51, 553 | 118 |
| Belgium..... | 72, 877 | 21, 965 | 42, 722 | 3, 701 | 41, 236 | 1, 378 | 44, 848 | 2, 618 | 43, 796 | 2, 505 |
| Netherlands..... | ³ 80, 702 | ³ 58, 435 | 29, 150 | 1, 699 | 29, 060 | 867 | 31, 532 | 586 | 29, 529 | 709 |
| Brazil ² | 20, 495 | 0 | 27, 452 | 22 | 31, 143 | 38 | 32, 216 | 3 | 36, 138 | — |
| Japan..... | ² 4, 116 | ² 28 | 27, 980 | 4, 899 | 18, 458 | 4, 014 | 21, 995 | 4, 859 | 28, 203 | 768 |
| China ³ | 6, 691 | 5, 401 | 10, 162 | 1, 343 | 22, 354 | 374 | 15, 464 | 1, 464 | — | — |
| Czechoslovakia..... | 0 | 0 | 19, 388 | 212 | 21, 085 | 89 | 21, 323 | 41 | 17, 248 | 56 |
| Austria..... | ³ 11, 402 | ³ 871 | 14, 822 | ⁶ 171 | 16, 888 | 89 | 16, 230 | 165 | — | — |
| Switzerland..... | ³ 16, 937 | ³ 14 | 14, 245 | 0 | 17, 220 | 0 | 18, 427 | 0 | 15, 496 | 0 |
| Greece..... | ¹ 7, 035 | ¹ 2 | 18, 003 | 0 | 19, 502 | 0 | 19, 106 | 0 | 22, 144 | 0 |
| Irish Free State..... | 0 | 0 | 18, 539 | 90 | 19, 511 | 37 | 19, 691 | 56 | 17, 930 | — |
| Sweden..... | ³ 7, 080 | ³ 23 | 6, 677 | 639 | 8, 484 | 2, 576 | 10, 391 | 1, 660 | 10, 553 | 3, 076 |
| Egypt..... | ³ 8, 244 | ³ 59 | 12, 520 | 26 | 8, 861 | 64 | 6, 803 | 433 | 12, 906 | 181 |
| Denmark..... | ³ 7, 155 | ³ 597 | 6, 886 | 897 | 7, 695 | 1, 085 | 10, 701 | 220 | 17, 149 | 110 |
| Poland..... | 0 | 0 | 3, 460 | 5, 080 | 8, 331 | 933 | 7, 840 | 225 | 3, 865 | 106 |
| Union of South Africa..... | ¹ 6, 274 | ¹ 253 | 6, 063 | 15 | 4, 110 | 8 | 8, 212 | 8 | — | — |
| Norway..... | ³ 3, 674 | ³ 0 | 6, 346 | ³ 5 | 5, 944 | ³ 4 | 6, 862 | ³ 4 | 8, 538 | — |
| Cuba..... | 4, 248 | 0 | 5, 773 | 0 | 5, 695 | 0 | 5, 740 | 0 | — | — |
| Finland..... | ¹ 4, 912 | ¹ 0 | 4, 879 | 0 | 4, 854 | 0 | 5, 499 | 0 | 6, 095 | 0 |
| New Zealand..... | ¹ 163 | ¹ 918 | 2, 978 | 1 | 2, 769 | 1 | 1, 032 | 1 | 703 | 2 |
| Syria and Lebanon ⁴ | 0 | 0 | 3, 168 | 0 | 1, 080 | 0 | — | — | — | — |
| Latvia..... | 0 | 0 | 1, 579 | ² 2 | 1, 690 | ³ 50 | — | — | — | — |
| Indo-China..... | 0 | 0 | 1, 094 | ⁴ 0 | 1, 143 | ⁴ 0 | 1, 073 | 0 | — | — |
| Estonia..... | 0 | 0 | 952 | 0 | 902 | 0 | 1, 062 | 0 | 1, 176 | 0 |
| Ceylon ⁵ | 0 | 0 | 896 | 0 | 927 | 0 | — | — | — | — |
| Total 42 countries..... | 692, 969 | 795, 602 | 687, 929 | 754, 725 | 790, 196 | 899, 991 | 789, 527 | 850, 527 | 673, 301 | 989, 018 |

Bureau of Agricultural Economics. Official sources except where otherwise noted.

¹ Average of calendar years, 1909-1913.² Trade sources.³ Year ended July 31, International Yearbook of Agricultural Statistics.⁴ International Crop Report and Agricultural Statistics.⁵ Year ended Dec. 31.⁶ International Yearbook of Agricultural Statistics.

STATISTICS OF GRAINS

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TABLE 19.—*Wheat, all: Estimated average price per bushel, received by producers, United States, 1909-1929*

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weighted average |
|---------------------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|------------------|
| | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| 1909 | 114.0 | 101.2 | 94.9 | 97.2 | 99.2 | 101.0 | 104.2 | 105.0 | 104.8 | 102.2 | 98.8 | 96.4 | 100.7 |
| 1910 | 97.1 | 97.4 | 94.8 | 92.1 | 89.4 | 88.4 | 89.2 | 87.6 | 84.6 | 84.2 | 85.4 | 85.3 | 91.7 |
| 1911 | 83.5 | 83.8 | 86.6 | 90.0 | 89.4 | 87.7 | 89.2 | 90.6 | 91.6 | 96.1 | 101.2 | 100.9 | 88.3 |
| 1912 | 94.4 | 87.8 | 84.6 | 83.6 | 79.7 | 76.1 | 78.0 | 80.2 | 79.8 | 80.0 | 81.8 | 82.0 | 83.3 |
| 1913 | 79.2 | 77.1 | 77.5 | 77.4 | 78.4 | 80.4 | 81.3 | 82.4 | 83.6 | 84.0 | 84.2 | 80.6 | 79.3 |
| 1914 | 76.7 | 84.9 | 93.4 | 95.4 | 97.9 | 103.2 | 118.8 | 131.8 | 132.6 | 135.6 | 135.6 | 117.2 | 99.4 |
| 1915 | 104.0 | 100.8 | 93.0 | 92.0 | 92.5 | 97.4 | 108.4 | 108.4 | 100.8 | 100.6 | 101.2 | 96.5 | 98.2 |
| 1916 | 100.0 | 119.2 | 133.8 | 147.4 | 159.4 | 155.3 | 157.6 | 164.6 | 172.2 | 213.0 | 247.2 | 234.3 | 144.4 |
| 1917 | 224.5 | 219.3 | 205.2 | 200.3 | 200.4 | 201.4 | 201.6 | 202.0 | 202.6 | 203.1 | 203.0 | 202.8 | 205.8 |
| 1918 | 203.8 | 205.0 | 205.7 | 205.9 | 205.1 | 204.5 | 206.2 | 207.8 | 211.1 | 222.6 | 229.8 | 225.2 | 206.3 |
| 1919 | 219.6 | 211.4 | 207.6 | 211.4 | 214.0 | 223.4 | 233.8 | 231.2 | 230.3 | 242.6 | 250.8 | 256.0 | 218.6 |
| 1920 | 242.9 | 225.4 | 216.5 | 201.2 | 165.8 | 146.4 | 149.2 | 148.2 | 140.4 | 122.1 | 119.0 | 119.8 | 182.9 |
| 1921 | 108.5 | 103.0 | 103.4 | 99.9 | 93.4 | 93.0 | 95.2 | 107.0 | 117.0 | 119.0 | 118.8 | 109.6 | 104.4 |
| 1922 | 99.8 | 92.6 | 89.2 | 94.1 | 99.4 | 103.2 | 104.6 | 104.4 | 106.0 | 108.4 | 108.2 | 100.8 | 98.0 |
| 1923 | 89.6 | 86.4 | 91.0 | 94.2 | 93.7 | 94.5 | 96.7 | 98.0 | 98.8 | 95.8 | 96.8 | 98.5 | 92.4 |
| 1924 | 105.8 | 116.8 | 114.2 | 129.7 | 133.6 | 141.1 | 162.1 | 169.8 | 164.0 | 140.5 | 149.1 | 152.7 | 127.8 |
| 1925 | 140.3 | 150.4 | 144.4 | 136.4 | 148.8 | 153.7 | 158.1 | 155.5 | 146.0 | 142.2 | 142.1 | 138.9 | 145.9 |
| 1926 | 127.7 | 125.1 | 117.7 | 121.4 | 123.6 | 122.8 | 122.2 | 122.8 | 120.9 | 117.2 | 123.2 | 130.1 | 123.8 |
| 1927 | 127.3 | 123.5 | 119.2 | 113.7 | 111.4 | 113.9 | 115.2 | 116.2 | 121.6 | 129.2 | 144.3 | 132.0 | 120.5 |
| 1928 | 118.1 | 95.2 | 94.4 | 98.7 | 97.1 | 98.2 | 98.5 | 104.2 | 104.7 | 99.8 | 90.1 | 86.8 | 100.1 |
| 1929 | 102.4 | 110.7 | 112.1 | 111.5 | 103.4 | 108.1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of wheat for each State; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1909-December, 1923.

TABLE 20.—*Wheat: Weighted average price¹ per bushel of reported cash sales of all classes and grades, six markets combined, 1923-1929*

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Weighted average ² |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1923 | 99.0 | 101.8 | 106.8 | 110.4 | 105.7 | 105.0 | 110.3 | 111.8 | 111.6 | 109.9 | 110.5 | 116.6 | 107.0 |
| 1924 | 125.7 | 123.5 | 128.3 | 144.8 | 148.2 | 163.6 | 188.8 | 184.8 | 172.1 | 150.8 | 165.5 | 161.6 | 145.3 |
| 1925 | 155.7 | 160.5 | 144.8 | 143.3 | 153.5 | 165.7 | 170.3 | 164.8 | 154.9 | 156.0 | 153.8 | 151.6 | 155.0 |
| 1926 | 141.6 | 135.3 | 135.6 | 139.4 | 137.7 | 139.5 | 138.8 | 136.2 | 133.6 | 134.7 | 145.1 | 148.6 | 138.3 |
| 1927 | 138.7 | 136.4 | 128.7 | 125.1 | 125.6 | 128.0 | 131.0 | 132.0 | 136.6 | 150.7 | 151.4 | 141.8 | 132.9 |
| 1928 | 126.0 | 109.4 | 108.9 | 107.0 | 109.1 | 107.4 | 113.7 | 118.1 | 114.2 | 109.2 | 101.1 | 105.3 | 110.6 |
| 1929 | 130.2 | 125.7 | 127.4 | 123.7 | 121.2 | 123.5 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Compiled from daily trade papers of markets named. The markets are Chicago, Minneapolis, Kansas City, St. Louis, Omaha, and Duluth.

¹ The prices in this table are comparable with prices paid to producers, in that the latter are averages of the several prices reported which cover all classes and grades sold by producers.

² A average of daily prices weighted by car-lot sales.

TABLE 21.—Wheat: Weighted average price¹ per bushel of reported cash sales, 1910-1929

NO. 1 NORTHERN SPRING, MINNEAPOLIS

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Weighted average ¹ |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1910..... | 121 | 113 | 109 | 108 | 104 | 103 | 106 | 102 | 98 | 96 | 99 | 97 | 105 |
| 1911..... | 99 | 105 | 109 | 110 | 105 | 102 | 106 | 106 | 108 | 110 | 116 | 113 | 107 |
| 1912..... | 109 | 98 | 89 | 90 | 84 | 82 | 89 | 87 | 85 | 88 | 91 | 92 | 87 |
| 1913..... | 91 | 88 | 87 | 84 | 85 | 86 | 87 | 93 | 92 | 91 | 94 | 92 | 88 |
| 1914..... | 92 | 110 | 112 | 111 | 118 | 120 | 138 | 152 | 149 | 158 | 158 | 135 | 120 |
| 1915..... | 144 | 118 | 97 | 102 | 102 | 114 | 129 | 126 | 114 | 122 | 122 | 111 | 109 |
| 1916..... | 121 | 164 | 164 | 179 | 195 | 179 | 193 | 186 | 203 | 238 | 206 | 273 | 176 |
| 1917..... | 266 | 247 | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 |
| 1918..... | 217 | 223 | 223 | 219 | 222 | 222 | 221 | 224 | 236 | 256 | 259 | 248 | 225 |
| 1919..... | 266 | 259 | 256 | 267 | 285 | 307 | 301 | 267 | 284 | 306 | 309 | 293 | 272 |
| 1920..... | 288 | 256 | 254 | 216 | 179 | 166 | 170 | 172 | 166 | 153 | 157 | 169 | 267 |
| 1921..... | 167 | 148 | 151 | 134 | 125 | 131 | 134 | 151 | 151 | 158 | 161 | 149 | 143 |
| 1922..... | 149 | 111 | 110 | 115 | 123 | 125 | 123 | 126 | 124 | 130 | 122 | 117 | 120 |
| 1923..... | 112 | 118 | 121 | 120 | 114 | 116 | 119 | 121 | 121 | 121 | 128 | 125 | 117 |
| 1924..... | 137 | 131 | 130 | 146 | 148 | 166 | 189 | 187 | 171 | 150 | 167 | 164 | 156 |
| 1925..... | 159 | 164 | 150 | 149 | 155 | 169 | 173 | 167 | 161 | 164 | 162 | 163 | 161 |
| 1926..... | 172 | 149 | 143 | 149 | 146 | 146 | 143 | 142 | 139 | 138 | 147 | 149 | 146 |
| 1927..... | 147 | 143 | 134 | 129 | 130 | 132 | 135 | 134 | 139 | 153 | 157 | 148 | 136 |
| 1928..... | 138 | 119 | 119 | 116 | 116 | 115 | 121 | 128 | 125 | 120 | 111 | 115 | 118 |
| 1929..... | 143 | 135 | 135 | 131 | 123 | 131 | | | | | | | |

NO. 2 RED WINTER, ST. LOUIS

| | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1910..... | 107 | 102 | 102 | 100 | 96 | 98 | 103 | 96 | 93 | 96 | 94 | 88 | 99 |
| 1911..... | 84 | 88 | 94 | 100 | 96 | 97 | 102 | 101 | 104 | 113 | 121 | 111 | 94 |
| 1912..... | 103 | 104 | 103 | 109 | 104 | 107 | 111 | 109 | 108 | 109 | 104 | 99 | 105 |
| 1913..... | 85 | 88 | 94 | 93 | 94 | 95 | 96 | 95 | 95 | 94 | 96 | 81 | 89 |
| 1914..... | 87 | 93 | 110 | 110 | 111 | 118 | 140 | 157 | 150 | 154 | 150 | 119 | 110 |
| 1915..... | 117 | 114 | 114 | 121 | 116 | 123 | 134 | 130 | 117 | 122 | 120 | 110 | 120 |
| 1916..... | 125 | 145 | 160 | 173 | 187 | 183 | 196 | 188 | 205 | 266 | 304 | 265 | 163 |
| 1917..... | 236 | 232 | 215 | 215 | 215 | 215 | 215 | 215 | 215 | 215 | 215 | 215 | 223 |
| 1918..... | 221 | 221 | 219 | 222 | 222 | 232 | 241 | 238 | 255 | 271 | 260 | 241 | 223 |
| 1919..... | 222 | 220 | 221 | 224 | 229 | 248 | 270 | 255 | 258 | 276 | 299 | 289 | 230 |
| 1920..... | 273 | 251 | 258 | 226 | 202 | 190 | 202 | 190 | 166 | 141 | 158 | 150 | 213 |
| 1921..... | 123 | 123 | 136 | 126 | 120 | 121 | 122 | 138 | 142 | 141 | 138 | 118 | 127 |
| 1922..... | 112 | 109 | 114 | 123 | 129 | 136 | 187 | 189 | 136 | 139 | 133 | 123 | 121 |
| 1923..... | 97 | 99 | 109 | 116 | 112 | 114 | 116 | 118 | 114 | 113 | 112 | 116 | 107 |
| 1924..... | 135 | 138 | 140 | 156 | 163 | 179 | 210 | 202 | 186 | 177 | 186 | 189 | 159 |
| 1925..... | 159 | 172 | 171 | 170 | 171 | 184 | 194 | 185 | 170 | 171 | 162 | 147 | 169 |
| 1926..... | 142 | 134 | 136 | 140 | 136 | 137 | 138 | 135 | 139 | 129 | 142 | 150 | 138 |
| 1927..... | 141 | 142 | 142 | 145 | 141 | 144 | 151 | 156 | 159 | 166 | 196 | 179 | 149 |
| 1928..... | 147 | 138 | 145 | 144 | 145 | 139 | 142 | 140 | 135 | 125 | 117 | 121 | 139 |
| 1929..... | 139 | 132 | 135 | 132 | 129 | 135 | | | | | | | |

NO. 2 HARD WINTER, KANSAS CITY

| | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1910..... | 104 | 100 | 99 | 95 | 91 | 93 | 95 | 90 | 88 | 88 | 90 | 88 | 96 |
| 1911..... | 87 | 93 | 95 | 104 | 100 | 100 | 105 | 103 | 105 | 109 | 111 | 109 | 97 |
| 1912..... | 92 | 89 | 88 | 88 | 83 | 84 | 87 | 86 | 86 | 88 | 87 | 88 | 82 |
| 1913..... | 82 | 83 | 87 | 94 | 83 | 84 | 85 | 86 | 88 | 87 | 90 | 85 | 84 |
| 1914..... | 78 | 91 | 104 | 102 | 108 | 113 | 134 | 154 | 149 | 154 | 150 | 121 | 105 |
| 1915..... | 136 | 126 | 107 | 107 | 103 | 112 | 120 | 120 | 105 | 112 | 110 | 100 | 119 |
| 1916..... | 114 | 141 | 157 | 167 | 185 | 172 | 189 | 182 | 197 | 243 | 301 | 274 | 171 |
| 1917..... | 208 | 261 | 212 | 212 | 212 | 212 | 212 | 212 | 212 | 212 | 212 | | |
| 1918..... | 220 | 216 | 216 | 216 | 215 | 224 | 231 | 226 | 239 | 262 | 260 | 247 | 219 |
| 1919..... | 225 | 218 | 224 | 230 | 246 | 263 | 282 | 242 | 249 | 275 | 293 | 276 | 242 |
| 1920..... | 268 | 245 | 244 | 207 | 176 | 169 | 172 | 162 | 155 | 133 | 147 | 138 | 183 |
| 1921..... | 118 | 115 | 122 | 110 | 109 | 109 | 113 | 129 | 134 | 135 | 134 | 117 | 120 |
| 1922..... | 113 | 104 | 104 | 113 | 117 | 117 | 114 | 115 | 116 | 120 | 116 | 104 | 113 |
| 1923..... | 96 | 101 | 109 | 112 | 109 | 109 | 113 | 111 | 109 | 104 | 106 | 108 | 105 |
| 1924..... | 120 | 119 | 120 | 137 | 143 | 162 | 182 | 181 | 171 | 151 | 163 | 160 | 135 |
| 1925..... | 154 | 164 | 158 | 158 | 163 | 172 | 178 | 171 | 161 | 159 | 155 | 153 | 163 |
| 1926..... | 137 | 131 | 132 | 139 | 137 | 138 | 137 | 135 | 133 | 131 | 142 | 144 | 135 |
| 1927..... | 136 | 135 | 131 | 128 | 131 | 132 | 133 | 133 | 138 | 152 | 160 | 147 | 135 |
| 1928..... | 120 | 106 | 107 | 110 | 112 | 111 | 114 | 118 | 116 | 110 | 101 | 105 | 112 |
| 1929..... | 125 | 123 | 124 | 122 | 119 | 121 | | | | | | | |

Bureau of Agricultural Economics. Compiled from Minneapolis Daily Market Record, St. Louis Daily Market Reporter, and Kansas City Grain Market Review, formerly Daily Price Current. Data, 1899-1908 available in 1924 Yearbook, pp. 582-583, Table 32.

¹ Average of daily prices weighted by car-lot sales.

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TABLE 22.—*Wheat, No. 3 Manitoba Northern: Average cash price per bushel at Winnipeg, in terms of United States money, 1909-1929*¹

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Average |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909..... | 124 | 102 | 94 | 94 | 94 | 94 | 99 | 98 | 100 | 98 | 91 | 87 | 98 |
| 1910..... | 102 | 102 | 97 | 89 | 85 | 84 | 88 | 86 | 85 | 86 | 90 | 90 | 90 |
| 1911..... | 91 | 95 | 95 | 94 | 90 | 85 | 87 | 89 | 91 | 96 | 97 | 100 | 93 |
| 1912..... | 99 | 100 | 91 | 87 | 78 | 74 | 76 | 78 | 80 | 85 | 87 | 90 | 85 |
| 1913..... | 89 | 88 | 82 | 77 | 80 | 78 | 81 | 85 | 87 | 86 | 91 | 89 | 84 |
| 1914..... | 87 | 103 | 105 | 104 | 111 | 111 | 131 | 148 | 144 | 153 | 152 | 121 | 122 |
| 1915..... | 127 | 125 | 89 | 92 | 96 | 103 | 116 | 117 | 104 | 109 | 111 | 105 | 108 |
| 1916..... | 112 | 142 | 155 | 166 | 186 | 167 | 172 | 161 | 177 | 210 | 264 | 230 | 180 |
| 1917..... | 226 | 235 | 215 | 214 | 215 | 215 | 213 | 213 | 212 | 211 | 212 | 211 | 216 |
| 1918..... | 213 | 211 | 213 | 213 | 214 | 214 | 213 | 213 | 213 | 212 | 211 | 211 | 213 |
| 1919..... | 210 | 220 | 247 | 247 | 245 | 248 | 234 | 221 | 220 | 235 | 231 | 226 | 232 |
| 1920..... | 225 | 232 | 240 | 202 | 179 | 160 | 162 | 160 | 161 | 149 | 160 | 160 | 183 |
| 1921..... | 156 | 150 | 125 | 100 | 93 | 94 | 95 | 118 | 124 | 126 | 130 | 117 | 119 |
| 1922..... | 120 | 107 | 95 | 96 | 105 | 104 | 103 | 105 | 105 | 113 | 111 | 108 | 106 |
| 1923..... | 99 | 103 | 96 | 89 | 87 | 83 | 86 | 90 | 88 | 89 | 92 | 105 | 92 |
| 1924..... | 126 | 134 | 136 | 150 | 153 | 161 | 184 | 167 | 167 | 149 | 174 | 162 | 157 |
| 1925..... | 153 | 160 | 132 | 120 | 136 | 149 | 146 | 144 | 138 | 146 | 144 | 144 | 143 |
| 1926..... | 149 | 138 | 133 | 136 | 131 | 123 | 123 | 127 | 130 | 133 | 116 | 119 | 135 |
| 1927..... | 153 | 145 | 131 | 127 | 124 | 124 | 123 | 124 | 131 | 141 | 142 | 130 | 138 |
| 1928..... | 120 | 108 | 106 | 111 | 111 | 109 | 112 | 120 | 119 | 115 | 107 | 112 | 118 |
| 1929..... | 152 | 152 | 144 | 134 | 126 | 130 | | | | | | | |

Bureau of Agricultural Economics. Compiled as follows: July, 1909-August, 1916, Winnipeg Farmers Advocate; September, 1916-June, 1920, annual reports of the Winnipeg Grain Exchange; July, 1921-July, 1928, Reports on the Grain Trade of Canada; August, 1928 to latest date shown, Minneapolis Daily Market Record. Conversions at current rate of exchange January, 1917-March, 1925. Exchange rates used are: January, 1917-June, 1919, mean of the monthly low and high, compiled from the Commercial and Financial Chronicle; July, 1919-March, 1925, monthly averages as reported by the Federal Reserve Board.

¹ Average of daily cash closing prices, basis, in store at Fort William and Port Arthur. Prices fixed by the Government Sept. 12, 1917-Aug. 17, 1920.

TABLE 23.—*Wheat: Average spot price per bushel of imported wheat at Liverpool, 1914-1929*

IMPORTED RED

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Average |
|---------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1914..... | 105 | 128 | 129 | 128 | 138 | 147 | 167 | 195 | 191 | 194 | 158 | 165 | 157 |
| 1915..... | 168 | 161 | 167 | 171 | 139 | 178 | 194 | 190 | 200 | 193 | 171 | 155 | 176 |
| 1916..... | 158 | 196 | 200 | 215 | 222 | 239 | 239 | 243 | 212 | 246 | 246 | 246 | 224 |
| 1917..... | 250 | 250 | 238 | 226 | 226 | 226 | 232 | 232 | 239 | 232 | 232 | 232 | 235 |
| 1918..... | 232 | 232 | 232 | 239 | 246 | 246 | 246 | 246 | 243 | 241 | 241 | 239 | 240 |
| 1919..... | 229 | 221 | 216 | 216 | 211 | 195 | 190 | 175 | 211 | 237 | 234 | 240 | 215 |
| 1920..... | 234 | 220 | 213 | 234 | 253 | 230 | 233 | 214 | 213 | 213 | 217 | 196 | 223 |
| 1921..... | ¹ 171 | ¹ 159 | ¹ 156 | ¹ 131 | ¹ 126 | ¹ 137 | 144 | 166 | 162 | 158 | 160 | 143 | 151 |
| 1922..... | 152 | 172 | 132 | 148 | 148 | 148 | 148 | 143 | 140 | 145 | 149 | 138 | 144 |
| 1923..... | 138 | 132 | 125 | 126 | 126 | 125 | 126 | (?) | 128 | 123 | 125 | 126 | 126 |
| 1924..... | 143 | 170 | 163 | 176 | 179 | 189 | 210 | 214 | 198 | 175 | 184 | 182 | 181 |
| 1925..... | 176 | 186 | 180 | 166 | 171 | 189 | 183 | 181 | 164 | 167 | 173 | 172 | 176 |

PARCELS

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Average |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1920..... | 167 | 162 | 160 | 171 | 171 | 163 | 160 | 157 | 155 | 156 | 165 | 165 | 163 |
| 1927..... | 161 | 160 | 151 | 149 | 147 | 148 | 149 | 146 | 151 | 159 | 155 | 147 | 152 |
| 1928..... | 141 | 126 | 126 | 129 | 129 | 126 | 131 | 135 | 131 | 125 | 116 | 117 | 128 |
| 1929..... | 141 | 142 | 137 | 136 | 125 | 141 | | | | | | | |

Bureau of Agricultural Economics. Price per bushel of 60 pounds, good average imported red, July, 1914-June, 1926, compiled from Broomhall's 1921, 1925, and 1927 Corn Trade Yearbooks. Price per bushel of 60 pounds July, 1926, to date, compiled from Broomhall's Corn Trade News. These prices are simple averages of daily sales prices of parcels at Liverpool. Conversions at par beginning with January, 1926. Prior to that date conversions were made at monthly average rate of exchange as given in Federal Reserve Bulletins.

¹ No. 2 hard winter when available, otherwise No. 2 red winter.

² No quotations.

TABLE 24.—Wheat ground in United States mills, census years, 1879-1927

| Year | Merchant mills | Custom mills | All mills | Year | Merchant mills | Custom mills | All mills |
|-----------|----------------|--------------|-------------|-------------------------|----------------|--------------|-------------|
| | 1,000 bush. | 1,000 bush. | 1,000 bush. | | 1,000 bush. | 1,000 bush. | 1,000 bush. |
| 1879..... | | | 304, 776 | 1919..... | 612, 563 | 8, 105 | 618, 668 |
| 1880..... | | | 385, 750 | 1921..... | 521, 234 | 8 6, 105 | 527, 339 |
| 1890..... | 471, 307 | 1 18, 607 | 480, 914 | 1923..... | 538, 312 | 8 6, 105 | 544, 417 |
| 1904..... | 494, 095 | 2 6, 988 | 501, 083 | 1925..... | 530, 593 | 8 6, 105 | 536, 698 |
| 1909..... | 496, 480 | 6, 988 | 503, 468 | 1927 ¹ | 544, 054 | 8 6, 105 | 550, 159 |
| 1914..... | 545, 728 | 2 6, 988 | 552, 716 | | | | |

Bureau of Agricultural Economics. Rearranged from reports of the Bureau of the Census, as follows: 1879 from 1880 Census of Manufactures, p. 451; 1889 from 1900 Census of Manufactures, Vol. IX, part 3, p. 365; 1899 and 1904 from 1910 Census of Manufactures, Vol. X, p. 415; 1909, 1914, and 1919 from 1919 Census of Manufactures, Vol. X, p. 110; 1921 from 1923 Biennial Census of Manufactures; 1923 and 1925 from 1925 Biennial Census of Manufactures; 1927 from release of Census of Manufactures, Mar. 6, 1929.

¹ Difference between all mills and merchant mills.

² 1909 custom mills.

³ 1919 custom mills.

⁴ Preliminary.

TABLE 25.—Flour, wheat, spring patents: Average wholesale price per barrel,¹ Minneapolis, 1909-1929

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Average |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1909..... | 6.21 | 5.89 | 5.14 | 5.29 | 5.22 | 5.48 | 5.58 | 5.45 | 5.52 | 5.38 | 5.42 | 5.33 | 5.46 |
| 1910..... | 6.20 | 5.79 | 5.75 | 5.21 | 5.03 | 5.01 | 5.28 | 4.91 | 4.75 | 4.64 | 4.89 | 4.81 | 5.19 |
| 1911..... | 4.88 | 4.88 | 4.98 | 5.25 | 5.05 | 5.05 | 5.00 | 5.10 | 5.10 | 5.10 | 5.43 | 5.60 | 5.12 |
| 1912..... | 5.43 | 5.24 | 4.68 | 4.63 | 4.59 | 4.13 | 4.26 | 4.43 | 4.43 | 4.43 | 4.43 | 4.63 | 4.61 |
| 1913..... | 4.66 | 4.57 | 4.45 | 4.33 | 4.18 | 4.15 | 4.26 | 4.52 | 4.54 | 4.51 | 4.51 | 4.51 | 4.43 |
| 1914..... | 4.62 | 5.78 | 6.02 | 5.58 | 5.79 | 6.01 | 6.86 | 7.54 | 7.16 | 7.61 | 7.41 | 6.78 | 6.43 |
| 1915..... | 6.78 | 6.42 | 5.13 | 5.23 | 5.28 | 5.98 | 6.23 | 6.13 | 5.70 | 5.90 | 5.79 | 5.29 | 5.82 |
| 1916..... | 5.68 | 7.69 | 8.26 | 9.08 | 9.56 | 8.60 | 9.00 | 8.45 | 9.44 | 11.33 | 14.09 | 13.08 | 9.52 |
| 1917..... | 12.86 | 13.22 | 11.15 | 10.84 | 10.24 | 10.07 | 9.85 | 10.05 | 9.89 | 9.90 | 9.42 | 9.89 | 10.62 |
| 1918..... | 10.45 | 10.53 | 10.49 | 10.44 | 10.41 | 10.44 | 10.42 | 10.69 | 11.22 | 12.09 | 12.52 | 12.00 | 10.98 |
| 1919..... | 12.15 | 12.13 | 11.54 | 12.03 | 13.20 | 14.48 | 14.97 | 13.73 | 13.41 | 14.69 | 15.49 | 14.64 | 13.54 |
| 1920..... | 14.12 | 13.33 | 13.02 | 11.45 | 9.74 | 9.28 | 9.94 | 9.38 | 9.10 | 8.30 | 9.04 | 9.40 | 10.51 |
| 1921..... | 9.27 | 8.34 | 8.62 | 7.67 | 7.39 | 7.26 | 7.33 | 8.17 | 8.27 | 8.46 | 8.32 | 7.71 | 8.07 |
| 1922..... | 7.95 | 7.22 | 6.68 | 6.76 | 6.88 | 6.86 | 6.71 | 6.72 | 6.72 | 7.00 | 6.80 | 6.35 | 6.89 |
| 1923..... | 6.21 | 6.37 | 6.45 | 6.43 | 6.21 | 6.30 | 6.44 | 6.51 | 6.49 | 6.56 | 6.83 | 7.12 | 6.49 |
| 1924..... | 7.72 | 7.69 | 7.52 | 8.19 | 8.22 | 9.03 | 9.80 | 10.02 | 9.34 | 8.54 | 9.12 | 8.86 | 8.07 |
| 1925..... | 8.78 | 9.04 | 8.52 | 8.52 | 8.81 | 9.52 | 9.85 | 9.46 | 9.19 | 9.20 | 9.00 | 9.32 | 9.10 |
| 1926..... | 9.27 | 8.50 | 7.87 | 8.08 | 7.85 | 8.02 | 7.95 | 7.85 | 7.74 | 7.75 | 8.23 | 8.39 | 8.12 |
| 1927..... | 8.26 | 7.98 | 7.52 | 7.43 | 7.38 | 7.37 | 7.48 | 7.47 | 7.88 | 8.48 | 8.68 | 8.36 | 7.86 |
| 1928..... | 7.92 | 7.20 | 7.16 | 6.89 | 6.79 | 6.64 | 6.84 | 7.27 | 7.29 | 7.22 | 6.82 | 6.94 | 7.08 |
| 1929..... | 8.57 | 8.10 | 7.94 | 7.53 | 7.44 | 7.69 | | | | | | | |

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record.

¹ In 98-pound cotton sacks.

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TABLE 26.—Bread: Average retail price per pound (baked weight) in leading cities of the United States, 1913-1929

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Average |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1913 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 | 5.9 |
| 1914 | 6.2 | 6.3 | 6.4 | 6.4 | 6.4 | 6.5 | 6.8 | 7.1 | 7.1 | 7.1 | 7.2 | 7.2 | 6.7 |
| 1915 | 7.1 | 7.1 | 7.0 | 7.0 | 6.9 | 6.9 | 6.9 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| 1916 | 7.0 | 7.1 | 7.7 | 8.1 | 8.4 | 7.8 | 7.9 | 8.0 | 8.1 | 8.4 | 9.5 | 9.6 | 8.1 |
| 1917 | 9.9 | 10.2 | 9.9 | 9.9 | 9.9 | 9.3 | 9.4 | 9.5 | 9.6 | 9.8 | 9.9 | 10.0 | 9.8 |
| 1918 | 10.0 | 9.9 | 9.9 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.9 | 9.8 |
| 1919 | 10.0 | 10.1 | 10.1 | 10.1 | 10.2 | 10.2 | 10.9 | 11.1 | 11.2 | 11.2 | 11.5 | 11.8 | 10.7 |
| 1920 | 11.9 | 11.9 | 11.9 | 11.8 | 11.6 | 10.8 | 10.8 | 10.6 | 10.5 | 10.3 | 9.9 | 9.8 | 11.0 |
| 1921 | 9.7 | 9.7 | 9.6 | 9.5 | 9.3 | 9.1 | 8.8 | 8.6 | 8.7 | 8.7 | 8.8 | 8.8 | 9.1 |
| 1922 | 8.8 | 8.7 | 8.7 | 8.7 | 8.7 | 8.6 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 |
| 1923 | 8.8 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 |
| 1924 | 8.7 | 8.8 | 8.8 | 8.8 | 8.9 | 8.9 | 9.2 | 9.5 | 9.4 | 9.4 | 9.4 | 9.4 | 9.1 |
| 1925 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 |
| 1926 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 |
| 1927 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.2 | 9.2 | 9.2 | 9.1 | 9.1 | 9.1 | 9.2 | 9.2 |
| 1928 | 9.2 | 9.2 | 9.1 | 9.1 | 9.1 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.1 |
| 1929 | 9.0 | 9.0 | 9.0 | 8.9 | 8.9 | 8.9 | | | | | | | |

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports of retail prices, monthly.

TABLE 27.—Bran, standard: Average wholesale price per ton in 100-pound sacks, Minneapolis, 1920-1929

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Average |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1920 | 45.52 | 41.86 | 38.42 | 30.62 | 31.30 | 26.41 | 25.93 | 21.44 | 21.63 | 16.41 | 15.97 | 14.80 | 27.53 |
| 1921 | 14.06 | 13.91 | 12.95 | 12.15 | 14.79 | 20.63 | 20.98 | 24.75 | 23.85 | 22.29 | 20.91 | 15.35 | 18.05 |
| 1922 | 15.31 | 14.06 | 16.88 | 21.81 | 22.65 | 24.09 | 25.99 | 27.34 | 28.22 | 27.74 | 26.75 | 20.83 | 22.64 |
| 1923 | 19.84 | 23.62 | 27.79 | 28.07 | 25.65 | 24.77 | 24.98 | 23.66 | 22.00 | 20.84 | 17.66 | 19.12 | 23.17 |
| 1924 | 22.27 | 23.43 | 23.00 | 24.66 | 25.62 | 30.43 | 30.14 | 24.49 | 23.45 | 23.46 | 26.84 | 26.34 | 25.34 |
| 1925 | 23.58 | 24.20 | 23.09 | 22.83 | 25.73 | 26.34 | 26.17 | 23.68 | 22.24 | 25.05 | 23.30 | 21.31 | 23.96 |
| 1926 | 22.02 | 21.69 | 21.64 | 21.33 | 23.14 | 26.02 | 26.48 | 27.64 | 26.96 | 27.31 | 28.43 | 26.51 | 24.93 |
| 1927 | 25.13 | 26.85 | 25.88 | 25.96 | 28.41 | 30.09 | 30.66 | 32.47 | 35.68 | 34.28 | 35.03 | 29.68 | 30.01 |
| 1928 | 27.29 | 24.12 | 25.49 | 28.09 | 30.82 | 31.69 | 30.54 | 28.64 | 26.88 | 22.93 | 22.38 | 22.56 | 26.79 |
| 1929 | 26.17 | 26.44 | 29.19 | 28.21 | 27.90 | 27.66 | | | | | | | |

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record.

TABLE 28.—Middlings, standard: Average wholesale price per ton, in 100-pound sacks, Minneapolis, 1909-1929

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Average |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1909 | 21.20 | 20.72 | 19.03 | 18.92 | 18.78 | 20.19 | 22.36 | 22.03 | 20.95 | 18.48 | 18.79 | 18.06 | 19.96 |
| 1910 | 21.59 | 21.94 | 19.76 | 19.40 | 20.84 | 22.10 | 21.94 | 20.34 | 20.92 | 21.40 | 20.92 | 20.79 | 21.03 |
| 1911 | 22.18 | 23.92 | 24.59 | 23.60 | 23.25 | 22.77 | 23.54 | 25.25 | 25.00 | 24.29 | 23.95 | 22.81 | 23.76 |
| 1912 | 23.90 | 22.88 | 22.28 | 20.51 | 18.37 | 18.60 | 19.65 | 18.96 | 17.39 | 16.62 | 17.04 | 18.73 | 19.58 |
| 1913 | 18.79 | 21.11 | 23.35 | 22.23 | 21.64 | 20.67 | 21.27 | 21.75 | 22.63 | 23.04 | 22.17 | 21.83 | 21.71 |
| 1914 | 21.20 | 24.27 | 23.25 | 20.52 | 20.90 | 21.88 | 23.10 | 22.67 | 21.22 | 23.12 | 22.69 | 22.68 | 22.29 |
| 1915 | 25.08 | 25.51 | 19.86 | 18.66 | 18.00 | 18.45 | 19.42 | 21.61 | 20.22 | 10.50 | 20.06 | 20.10 | 20.54 |
| 1916 | 19.88 | 21.48 | 22.59 | 27.19 | 30.81 | 27.88 | 28.83 | 32.55 | 34.20 | 39.56 | 36.09 | 33.24 | 29.52 |
| 1917 | 41.71 | 41.94 | 35.10 | 36.25 | 37.40 | 39.05 | 34.50 | 34.50 | 34.85 | 35.04 | 33.27 | 32.69 | 36.36 |
| 1918 | 27.91 | 31.00 | 30.89 | 30.77 | 30.09 | 36.27 | 48.84 | 44.14 | 38.58 | 40.74 | 44.81 | 42.92 | 37.25 |
| 1919 | 47.16 | 53.08 | 61.65 | 44.46 | 41.33 | 43.17 | 43.97 | 47.28 | 51.60 | 54.94 | 57.74 | 55.89 | 49.36 |
| 1920 | 54.22 | 52.12 | 45.79 | 30.58 | 28.86 | 23.94 | 23.47 | 20.91 | 20.87 | 15.39 | 15.29 | 14.83 | 28.86 |
| 1921 | 14.07 | 14.64 | 13.95 | 13.16 | 15.32 | 20.73 | 20.51 | 24.76 | 25.52 | 23.21 | 21.20 | 17.13 | 18.08 |
| 1922 | 17.30 | 16.24 | 18.03 | 23.06 | 23.23 | 23.73 | 25.81 | 27.26 | 28.11 | 27.79 | 28.85 | 25.69 | 23.76 |
| 1923 | 24.83 | 25.89 | 27.85 | 27.78 | 25.13 | 23.80 | 25.43 | 23.95 | 21.65 | 20.96 | 18.00 | 19.92 | 23.78 |
| 1924 | 24.46 | 25.68 | 25.27 | 26.64 | 27.99 | 31.44 | 33.08 | 26.09 | 23.62 | 24.28 | 29.07 | 29.68 | 27.25 |
| 1925 | 25.53 | 26.95 | 26.37 | 24.19 | 26.31 | 25.28 | 26.10 | 23.71 | 22.03 | 24.20 | 21.77 | 21.60 | 24.50 |
| 1926 | 22.96 | 23.01 | 22.67 | 22.31 | 24.16 | 27.38 | 27.35 | 28.61 | 28.46 | 27.79 | 29.13 | 29.10 | 26.03 |
| 1927 | 31.42 | 34.46 | 29.22 | 26.88 | 28.72 | 30.00 | 30.52 | 32.71 | 35.85 | 34.33 | 37.14 | 35.80 | 32.21 |
| 1928 | 32.18 | 24.31 | 27.44 | 28.61 | 31.01 | 31.21 | 30.46 | 28.31 | 26.28 | 22.76 | 21.98 | 22.64 | 27.27 |
| 1929 | 28.42 | 29.25 | 32.66 | 32.08 | 28.76 | 28.00 | | | | | | | |

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record.

TABLE 29.—Wheat futures: Volume of trading in all "contract" markets, by months, 1924-25 to 1928-29

| Year and market | July | August | September | October | November | December |
|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> |
| 1924-25 | 1,332,893 | 1,300,002 | 1,068,406 | 1,595,688 | 1,339,778 | 1,528,039 |
| 1925-26 | 1,459,986 | 1,560,407 | 1,474,886 | 1,572,048 | 1,500,362 | 2,340,337 |
| 1926-27 | 1,437,934 | 1,226,243 | 1,155,528 | 1,089,629 | 1,227,061 | 972,477 |
| 1927-28 | 1,017,662 | 1,144,500 | 923,946 | 917,756 | 837,630 | 542,903 |
| 1928-29 | 906,026 | 1,133,390 | 818,098 | 915,067 | 749,635 | 517,034 |
| Chicago Board of Trade | 829,797 | 919,034 | 628,301 | 714,916 | 542,958 | 417,146 |
| Chicago Open Board | 29,295 | 31,678 | 23,573 | 31,256 | 23,093 | 17,755 |
| Minneapolis | 44,663 | 84,329 | 77,964 | 84,305 | 84,896 | 38,657 |
| Kansas City | 75,620 | 74,399 | 33,094 | 32,301 | 48,253 | 21,214 |
| Duluth | 11,460 | 18,150 | 51,490 | 48,970 | 46,296 | 18,769 |
| St. Louis | 2,994 | 2,391 | 1,388 | 1,454 | 2,033 | 1,540 |
| Milwaukee | 1,491 | 1,871 | 1,698 | 2,070 | 1,505 | 1,404 |
| Seattle | 607 | 1,538 | 590 | 395 | 601 | 549 |

| Year and market | January | February | March | April | May | June | Total |
|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> |
| 1924-25 | 1,908,039 | 1,780,769 | 2,273,124 | 1,482,231 | 1,507,950 | 1,739,046 | 18,875,905 |
| 1925-26 | 1,455,099 | 1,284,398 | 1,864,390 | 1,397,062 | 1,221,504 | 1,203,900 | 18,345,015 |
| 1926-27 | 794,178 | 580,648 | 916,793 | 849,133 | 1,260,385 | 1,163,931 | 12,583,040 |
| 1927-28 | 384,203 | 507,925 | 922,726 | 1,590,458 | 1,471,075 | 941,234 | 11,201,018 |
| 1928-29 | 1,084,682 | 892,596 | 1,082,838 | 1,361,610 | 1,252,770 | 1,300,688 | 12,195,034 |
| Chicago Board of Trade | 909,187 | 743,378 | 905,276 | 1,106,146 | 1,040,212 | 1,151,259 | 9,907,610 |
| Chicago Open Board | 39,186 | 32,013 | 39,529 | 42,425 | 39,322 | 38,092 | 387,217 |
| Minneapolis | 68,923 | 57,325 | 66,920 | 68,077 | 85,353 | 95,558 | 880,870 |
| Kansas City | 42,354 | 36,929 | 22,340 | 62,303 | 48,192 | 58,797 | 575,805 |
| Duluth | 18,885 | 17,047 | 22,119 | 47,218 | 34,684 | 41,497 | 376,615 |
| St. Louis | 2,763 | 3,250 | 3,738 | 2,145 | 1,898 | 1,967 | 27,561 |
| Milwaukee | 2,956 | 2,239 | 2,540 | 2,477 | 2,385 | 2,407 | 25,043 |
| Seattle | 428 | 415 | 376 | 819 | 724 | 749 | 7,851 |
| Portland | | | | | | 362 | 362 |

Grain Futures Administration.

TABLE 30.—Wheat futures: Volume of trading on the Chicago Board of Trade by crop years, 1921-22 to 1928-29

| Crop year | Bushels | Crop year | Bushels |
|-----------|----------------|-----------|----------------|
| 1921-22 | 12,814,000,000 | 1925-26 | 15,860,000,000 |
| 1922-23 | 9,625,000,000 | 1926-27 | 10,619,000,000 |
| 1923-24 | 6,124,000,000 | 1927-28 | 9,203,000,000 |
| 1924-25 | 16,587,000,000 | 1928-29 | 9,907,000,000 |

Grain Futures Administration.

TABLE 31.—Wheat: Amount of open commitments in the various futures on the Chicago Board of Trade shown semimonthly, June 30, 1928-June 30, 1929

| Date | Future | | | | | |
|----------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | July | September | December | March | May | All futures |
| 1928 | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> |
| June 30 | 16,197 | 54,902 | 16,150 | | | 87,159 |
| July 14 | 2,035 | 57,214 | 23,053 | | | 83,502 |
| July 31 | | 57,488 | 44,004 | 2 | | 102,094 |
| Aug. 15 | | 42,696 | 64,199 | 2,307 | 3,125 | 112,327 |
| Aug. 31 | | 18,868 | 78,457 | 4,014 | 11,400 | 112,739 |
| Sept. 15 | | 7,170 | 82,010 | 4,736 | 21,636 | 116,152 |
| Sept. 29 | | | 77,435 | 5,660 | 27,417 | 110,512 |
| Oct. 15 | | | 77,257 | 7,131 | 38,787 | 123,175 |
| Oct. 31 | 10 | | 71,847 | 7,249 | 45,646 | 124,762 |
| Nov. 15 | 150 | | 63,506 | 8,045 | 58,018 | 129,799 |
| Nov. 30 | 255 | | 28,146 | 12,261 | 91,841 | 132,503 |
| Dec. 15 | 606 | | 11,503 | 13,304 | 102,549 | 127,961 |
| Dec. 31 | 2,548 | | | 14,222 | 112,671 | 129,461 |

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TABLE 31.—Wheat: Amount of open commitments in the various futures on the Chicago Board of Trade shown semimonthly, June 30, 1928–June 30, 1929—Con.

| Date | Future | | | | | |
|---------|-------------|-------------|-------------|-------------|-------------|--------------|
| | July | September | December | March | May | All futures: |
| 1929 | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. |
| Jan. 15 | 9,415 | 35 | | 11,909 | 94,919 | 116,277 |
| Jan. 31 | 21,867 | 35 | | 9,073 | 85,342 | 115,317 |
| Feb. 15 | 31,551 | 40 | | 6,745 | 89,314 | 127,650 |
| Feb. 28 | 43,662 | 160 | | 5,926 | 92,033 | 141,781 |
| Mar. 15 | 51,747 | 4,066 | | 1,579 | 88,533 | 145,927 |
| Mar. 30 | 54,697 | 10,693 | | | 78,031 | 143,421 |
| Apr. 15 | 61,424 | 20,656 | 1,021 | | 63,803 | 146,901 |
| Apr. 30 | 74,117 | 31,758 | 8,458 | | 18,724 | 133,055 |
| May 15 | 75,152 | 35,484 | 15,136 | | 1,302 | 127,07 |
| May 31 | 67,106 | 43,481 | 23,434 | | | 134,02 |
| June 15 | 46,361 | 49,077 | 30,039 | | | 125,47 |
| June 29 | 12,698 | 83,621 | 43,363 | | 90 | 139,77 |

Grain Futures Administration. The maximum open commitments in all wheat futures was 155,109,000 bushels on Apr. 22, 1929. The minimum was 82,738,000 bushels on July 13, 1928.

TABLE 32.—Rye: Acreage, production, value, exports, etc., United States, 1909–1929

| Year | Acreage harvested | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Price per bushel of No. 2 rye at Minneapolis Year beginning July 1 ¹ | Foreign trade, including flour, year beginning July 1 ² | | | |
|-------------------|-------------------|------------------------|---------------|---|-------------------|---|--|---------------|--------------------------|----------|
| | | | | | | | Domestic exports | Imports | Net exports ³ | |
| | 1,000 acres | Bushels of 56 lbs. | 1,000 bushels | Cents | 1,000 dollars | Cents | 1,000 bushels | 1,000 bushels | 1,000 bushels | Per cent |
| 1909 | 2,196 | 18.4 | 29,520 | | | | | | | |
| 1909 | 2,196 | 16.1 | 35,406 | 72.2 | 25,548 | 70 | 212 | 30 | 212 | .6 |
| 1910 | 2,185 | 16.0 | 34,897 | 71.5 | 24,953 | 77 | 40 | 227 | 4167 | .5 |
| 1911 | 2,127 | 15.6 | 33,119 | 83.2 | 27,557 | 86 | 31 | 131 | 4103 | 1.3 |
| 1912 | 2,117 | 16.8 | 35,664 | 66.3 | 23,636 | 60 | 1,855 | 1 | 1,854 | 5.2 |
| 1913 | 2,557 | 16.2 | 41,381 | 63.4 | 26,220 | 58 | 2,273 | 37 | 2,236 | 5.1 |
| 1914 | 2,541 | 16.8 | 42,779 | 86.5 | 37,018 | 98 | 13,027 | 147 | 12,880 | 30.1 |
| 1915 | 3,129 | 17.3 | 54,050 | 83.4 | 45,083 | 94 | 15,250 | 506 | 11,684 | 27.2 |
| 1916 | 3,213 | 15.2 | 48,862 | 122.1 | 59,676 | 135 | 13,703 | 428 | 14,275 | 27.2 |
| 1917 | 4,317 | 14.6 | 62,933 | 106.0 | 104,447 | 193 | 17,186 | 834 | 16,352 | 26.0 |
| 1918 | 6,391 | 14.2 | 91,041 | 151.6 | 138,038 | 158 | 36,467 | 638 | 35,829 | 39.4 |
| 1919 | 7,679 | 9.9 | 75,992 | | | | | | | |
| 1919 | 6,307 | 12.0 | 75,483 | 133.2 | 100,573 | 160 | 41,531 | 1,077 | 40,454 | 53.6 |
| 1920 | 4,409 | 13.7 | 60,490 | 126.8 | 76,693 | 161 | 47,337 | 452 | 46,885 | 77.5 |
| 1921 | 4,528 | 13.6 | 61,675 | 69.7 | 43,014 | 92 | 29,944 | 700 | 29,244 | 47.4 |
| 1922 | 6,072 | 15.5 | 103,362 | 68.5 | 70,841 | 75 | 51,663 | 99 | 51,564 | 49.9 |
| 1923 | 5,171 | 12.2 | 63,077 | 65.0 | 40,971 | 65 | 19,002 | 2 | 19,000 | 31.5 |
| 1924 | 3,744 | 14.9 | 55,674 | | | | | | | |
| 1924 | 4,150 | 15.8 | 65,520 | 106.4 | 69,742 | 114 | 50,242 | 1 | 50,241 | 76.7 |
| 1925 | 3,974 | 11.7 | 46,456 | 78.2 | 36,340 | 88 | 12,647 | | 12,616 | 27.2 |
| 1926 | 3,574 | 11.4 | 40,740 | 83.4 | 33,991 | 98 | 21,698 | 1 | 21,697 | 53.2 |
| 1927 | 3,648 | 15.0 | 58,164 | 85.3 | 49,609 | 104 | 26,346 | 2 | 26,345 | 45.3 |
| 1928 | 3,480 | 12.5 | 43,366 | 86.0 | 37,290 | 95 | 9,488 | 1 | 9,487 | 22.7 |
| 1929 ⁴ | 3,225 | 12.6 | 40,629 | 87.1 | 35,371 | | | | | |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns. See 1927 Yearbook, page 764, for data for earlier years.

¹ Prices are from Minneapolis Daily Market Record and are averages of daily prices weighted by car-load sales.

² Compiled from Commerce and Navigation of the United States, 1909–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1929 and official records of the Bureau of Foreign and Domestic Commerce. Rye—General imports, 1909; imports for consumption, 1910–1929. Rye flour—Imports for consumption, 1909–1929. Rye flour converted to rye on the basis that 1 barrel of rye flour is the product of 6 bushels of grain.

³ Total exports (domestic plus foreign) minus total imports.

⁴ Net imports.

⁵ Preliminary.

TABLE 33.—*Rye: Acreage and production, by States, average 1923-1927, annual 1928-1929*

| State and division | Acreage | | | | | Production | | | | |
|---------------------|-----------------------|----------------|----------------|----------------|-------------------|-----------------------|------------------|------------------|------------------|-------------------|
| | Av., 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ | Av., 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Connecticut..... | 2 | | | | | | | | | |
| New York..... | 36 | 25 | 21 | 20 | 20 | 598 | 388 | 368 | 314 | 310 |
| New Jersey..... | 47 | 41 | 36 | 41 | 49 | 854 | 779 | 720 | 758 | 631 |
| Pennsylvania..... | 126 | 93 | 86 | 103 | 124 | 2,105 | 1,488 | 1,462 | 1,596 | 1,984 |
| North Atlantic.. | 211 | 159 | 143 | 164 | 193 | 3,504 | 2,655 | 2,550 | 2,668 | 3,225 |
| Ohio..... | 56 | 50 | 35 | 30 | 57 | 888 | 875 | 560 | 399 | 889 |
| Indiana..... | 174 | 145 | 119 | 86 | 125 | 2,347 | 2,102 | 1,618 | 946 | 1,625 |
| Illinois..... | 111 | 83 | 62 | 62 | 75 | 1,630 | 1,245 | 899 | 899 | 1,088 |
| Michigan..... | 255 | 173 | 178 | 182 | 166 | 3,534 | 2,336 | 2,617 | 2,366 | 2,241 |
| Wisconsin..... | 285 | 256 | 238 | 167 | 185 | 4,476 | 3,840 | 4,046 | 2,171 | 2,960 |
| Minnesota..... | 570 | 440 | 383 | 421 | 396 | 9,161 | 5,940 | 7,009 | 6,315 | 6,930 |
| Iowa..... | 39 | 31 | 43 | 49 | 50 | 602 | 542 | 645 | 760 | 800 |
| Missouri..... | 22 | 24 | 16 | 19 | 20 | 269 | 310 | 176 | 228 | 200 |
| North Dakota..... | 1,376 | 1,222 | 1,381 | 1,268 | 935 | 15,807 | 9,287 | 23,063 | 14,278 | 8,415 |
| South Dakota..... | 197 | 103 | 154 | 162 | 186 | 2,404 | 639 | 2,772 | 1,458 | 2,046 |
| Nebraska..... | 211 | 253 | 274 | 249 | 262 | 2,712 | 2,606 | 4,110 | 3,486 | 3,604 |
| Kansas..... | 42 | 41 | 45 | 27 | 19 | 471 | 480 | 576 | 437 | 238 |
| North Central.. | 3,336 | 2,821 | 2,928 | 2,752 | 2,476 | 44,361 | 30,202 | 48,091 | 33,743 | 31,126 |
| Delaware..... | 4 | 4 | 3 | 3 | 4 | 64 | 60 | 45 | 45 | 58 |
| Maryland..... | 16 | 15 | 14 | 15 | 17 | 264 | 270 | 214 | 225 | 280 |
| Virginia..... | 40 | 43 | 42 | 40 | 53 | 485 | 580 | 496 | 621 | 625 |
| West Virginia..... | 10 | 12 | 8 | 7 | 8 | 120 | 156 | 104 | 94 | 93 |
| North Carolina..... | 85 | 104 | 94 | 89 | 98 | 964 | 1,352 | 1,128 | 1,024 | 1,176 |
| South Carolina..... | 8 | 8 | 9 | 7 | 7 | 91 | 112 | 117 | 80 | 88 |
| Georgia..... | 22 | 22 | 26 | 22 | 18 | 215 | 264 | 260 | 220 | 171 |
| South Atlantic.. | 184 | 208 | 196 | 189 | 205 | 2,203 | 2,794 | 2,364 | 2,309 | 2,491 |
| Kentucky..... | 17 | 18 | 14 | 7 | 15 | 208 | 279 | 154 | 87 | 165 |
| Tennessee..... | 23 | 32 | 26 | 25 | 32 | 255 | 448 | 208 | 205 | 256 |
| Arkansas..... | 1 | 1 | 1 | 1 | 1 | 10 | 11 | 10 | 9 | 9 |
| Oklahoma..... | 33 | 36 | 22 | 26 | 28 | 423 | 558 | 198 | 312 | 308 |
| Texas..... | 16 | 20 | 14 | 15 | 16 | 202 | 380 | 98 | 180 | 240 |
| South Central.. | 90 | 107 | 77 | 74 | 92 | 1,100 | 1,676 | 668 | 793 | 978 |
| Montana..... | 111 | 107 | 134 | 154 | 111 | 1,506 | 1,284 | 2,412 | 2,156 | 1,221 |
| Idaho..... | 5 | 3 | 3 | 3 | 3 | 90 | 46 | 48 | 48 | 42 |
| Wyoming..... | 46 | 51 | 54 | 40 | 40 | 565 | 714 | 675 | 400 | 360 |
| Colorado..... | 81 | 85 | 76 | 74 | 81 | 854 | 978 | 798 | 814 | 891 |
| New Mexico..... | 1 | 1 | 1 | 1 | 1 | 17 | 18 | 6 | 12 | 18 |
| Utah..... | 5 | 4 | 4 | 3 | 3 | 53 | 36 | 40 | 24 | 21 |
| Washington..... | 18 | 18 | 22 | 18 | 12 | 235 | 216 | 352 | 279 | 144 |
| Oregon..... | 15 | 10 | 10 | 8 | 8 | 215 | 130 | 160 | 120 | 112 |
| Far Western.... | 283 | 279 | 304 | 301 | 259 | 3,535 | 3,422 | 4,491 | 3,853 | 2,809 |
| United States... | 4,105 | 3,574 | 3,648 | 3,480 | 3,225 | 54,793 | 40,749 | 58,104 | 43,366 | 40,629 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.² 3-year average.

STATISTICS OF GRAINS

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TABLE 34.—Rye: Yield per acre and estimated price per bushel, December 1, by States, averages, and annual 1924-1929

| State and division | Yield per acre | | | | | | | Estimated price per bushel | | | | | | |
|---------------------|-----------------------|-------|-------|-------|-------|-------|-------|----------------------------|-------|-------|-------|-------|-------|-------|
| | Av., 1918- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Av., 1923- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| Connecticut..... | 19.2 | 18.0 | 19.0 | | | | | 140 | 130 | | | | | |
| New York..... | 16.4 | 17.0 | 16.5 | 15.5 | 17.5 | 15.7 | 15.5 | 102 | 113 | 100 | 100 | 105 | 112 | 114 |
| New Jersey..... | 18.1 | 17.5 | 18.0 | 19.0 | 20.0 | 18.5 | 19.0 | 98 | 113 | 93 | 95 | 97 | 104 | 103 |
| Pennsylvania..... | 16.5 | 16.0 | 17.0 | 16.0 | 17.0 | 15.5 | 16.0 | 102 | 113 | 105 | 97 | 105 | 107 | 106 |
| North Atlantic..... | 16.9 | 16.5 | 17.1 | 16.7 | 17.8 | 16.3 | 16.7 | 101.3 | 113.1 | 101.4 | 96.8 | 102.7 | 106.7 | 105.9 |
| Ohio..... | 15.5 | 16.0 | 15.0 | 17.5 | 16.0 | 13.3 | 15.6 | 91 | 111 | 88 | 88 | 92 | 103 | 98 |
| Indiana..... | 13.6 | 13.5 | 11.4 | 14.5 | 13.6 | 11.0 | 13.0 | 87 | 106 | 85 | 85 | 88 | 94 | 90 |
| Illinois..... | 15.7 | 14.5 | 13.8 | 15.0 | 14.5 | 14.5 | 14.5 | 90 | 107 | 90 | 86 | 92 | 92 | 89 |
| Michigan..... | 13.7 | 14.5 | 12.5 | 13.5 | 14.7 | 13.0 | 13.5 | 83 | 106 | 78 | 78 | 89 | 93 | 88 |
| Wisconsin..... | 15.6 | 17.0 | 14.8 | 15.0 | 17.0 | 13.0 | 16.0 | 85 | 109 | 76 | 84 | 90 | 90 | 89 |
| Minnesota..... | 16.9 | 22.0 | 13.0 | 13.5 | 18.3 | 15.0 | 17.5 | 79 | 108 | 71 | 76 | 85 | 85 | 82 |
| Iowa..... | 17.2 | 18.0 | 16.4 | 17.5 | 15.0 | 15.5 | 16.0 | 83 | 102 | 80 | 82 | 86 | 86 | 85 |
| Missouri..... | 12.3 | 13.5 | 12.0 | 12.9 | 11.0 | 12.0 | 10.0 | 107 | 105 | 120 | 113 | 110 | 106 | 107 |
| North Dakota..... | 11.3 | 15.0 | 10.0 | 7.6 | 16.7 | 11.0 | 9.0 | 74 | 104 | 65 | 73 | 80 | 76 | 76 |
| South Dakota..... | 13.8 | 14.0 | 9.5 | 6.2 | 18.0 | 9.0 | 11.0 | 74 | 102 | 67 | 73 | 79 | 79 | 76 |
| Nebraska..... | 13.1 | 14.5 | 12.3 | 10.3 | 15.0 | 14.0 | 14.1 | 75 | 97 | 71 | 76 | 77 | 77 | 76 |
| Kansas..... | 11.7 | 14.2 | 8.9 | 11.7 | 12.8 | 16.2 | 12.5 | 91 | 98 | 98 | 94 | 92 | 82 | 85 |
| North Central..... | 13.6 | 16.4 | 11.4 | 10.7 | 16.4 | 12.3 | 12.6 | 79.3 | 105.4 | 71.6 | 78.3 | 82.7 | 81.8 | 81.7 |
| Delaware..... | 14.0 | 13.5 | 15.0 | 15.0 | 15.0 | 15.0 | 14.5 | 113 | 125 | 120 | 110 | 115 | 120 | 115 |
| Maryland..... | 15.7 | 15.0 | 19.0 | 18.0 | 15.0 | 15.0 | 16.5 | 110 | 122 | 114 | 105 | 110 | 115 | 110 |
| Virginia..... | 11.9 | 11.5 | 12.0 | 13.5 | 11.8 | 13.5 | 11.8 | 118 | 128 | 127 | 112 | 115 | 120 | 120 |
| West Virginia..... | 12.2 | 11.2 | 13.0 | 13.0 | 13.0 | 13.5 | 11.6 | 114 | 129 | 120 | 110 | 110 | 115 | 116 |
| North Carolina..... | 9.8 | 9.0 | 11.5 | 13.0 | 12.0 | 11.5 | 12.0 | 140 | 149 | 157 | 125 | 135 | 145 | 140 |
| South Carolina..... | 11.1 | 11.0 | 10.5 | 14.0 | 13.0 | 11.5 | 12.5 | 185 | 190 | 210 | 175 | 175 | 185 | 190 |
| Georgia..... | 9.6 | 9.2 | 9.3 | 12.0 | 10.0 | 10.0 | 9.5 | 176 | 183 | 180 | 160 | 165 | 175 | 189 |
| South Atlantic..... | 11.4 | 10.5 | 12.3 | 13.4 | 12.1 | 12.2 | 12.2 | 134.2 | 143.8 | 144.5 | 124.6 | 132.3 | 137.9 | 135.2 |
| Kentucky..... | 12.1 | 11.0 | 13.0 | 15.5 | 11.0 | 12.4 | 11.0 | 117 | 127 | 125 | 108 | 120 | 132 | 122 |
| Tennessee..... | 9.8 | 11.0 | 11.0 | 14.0 | 8.0 | 8.2 | 8.0 | 127 | 138 | 130 | 120 | 129 | 138 | 133 |
| Arkansas..... | 10.3 | 11.0 | 11.0 | 11.0 | 10.0 | 9.0 | 9.0 | 129 | 131 | 130 | 125 | 140 | 140 | 135 |
| Oklahoma..... | 12.4 | 14.0 | 12.0 | 15.5 | 9.0 | 12.0 | 11.0 | 98 | 101 | 110 | 90 | 99 | 92 | 90 |
| Texas..... | 11.7 | 16.0 | 4.0 | 19.0 | 7.0 | 12.0 | 15.0 | 104 | 111 | 120 | 97 | 95 | 103 | 92 |
| South Central..... | 11.8 | 13.2 | 10.6 | 15.7 | 8.7 | 10.7 | 10.6 | 109.8 | 113.7 | 119.2 | 102.9 | 113.2 | 111.3 | 107.5 |
| Montana..... | 11.6 | 14.0 | 12.5 | 12.0 | 18.0 | 14.0 | 11.0 | 73 | 91 | 74 | 75 | 73 | 69 | 72 |
| Idaho..... | 15.6 | 10.0 | 20.0 | 15.5 | 16.0 | 16.0 | 14.0 | 84 | 122 | 80 | 73 | 75 | 72 | 85 |
| Wyoming..... | 14.2 | 10.0 | 12.0 | 14.0 | 12.5 | 10.0 | 9.0 | 71 | 88 | 64 | 67 | 69 | 72 | 68 |
| Colorado..... | 10.1 | 9.0 | 10.0 | 11.5 | 10.5 | 11.0 | 11.0 | 70 | 85 | 67 | 71 | 70 | 70 | 71 |
| New Mexico..... | 13.0 | 16.0 | 4.0 | 18.0 | 6.0 | 12.0 | 18.0 | 90 | 109 | 100 | 85 | 75 | 80 | 82 |
| Utah..... | 9.6 | 6.6 | 11.0 | 9.0 | 10.0 | 8.0 | 7.0 | 92 | 107 | 100 | 80 | 82 | 87 | 91 |
| Washington..... | 11.8 | 7.9 | 11.0 | 12.0 | 16.0 | 15.5 | 12.0 | 104 | 133 | 125 | 100 | 90 | 90 | 95 |
| Oregon..... | 12.6 | 10.0 | 14.0 | 13.0 | 16.0 | 15.0 | 14.0 | 106 | 136 | 110 | 96 | 95 | 102 | 115 |
| Far Western..... | 11.6 | 10.9 | 11.6 | 12.3 | 14.8 | 12.8 | 10.8 | 75.7 | 92.3 | 74.7 | 74.6 | 74.1 | 72.3 | 74.5 |
| United States..... | 13.6 | 15.8 | 11.7 | 11.4 | 15.9 | 12.5 | 12.6 | 83.7 | 106.4 | 78.2 | 83.4 | 85.3 | 86.0 | 87.1 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ 8-year average.

84722°—30—40+

TABLE 35.—*Rye: Acreage, yield per acre, and production in specified countries, average 1909-1918, 1921-1925, annual, 1927-1929*

| Country | Acreage | | | | Yield per acre | | | | Production | | | |
|----------------------------|--------------------|--------|--------|-------------------|--------------------|------|------|-------------------|--------------------|---------|---------|-------------------|
| | Average, 1909-1918 | 1927 | 1928 | 1929, preliminary | Average, 1909-1918 | 1927 | 1928 | 1929, preliminary | Average, 1909-1918 | 1927 | 1928 | 1929, preliminary |
| NORTHERN HEMISPHERE | | | | | | | | | | | | |
| NORTH AMERICA | | | | | | | | | | | | |
| Canada..... | 1,117 | 1,286 | 840 | 992 | 17.9 | 14.4 | 17.4 | 13.3 | 19,934 | 14,951 | 13,618 | 14,518 |
| United States..... | 2,226 | 3,648 | 3,460 | 3,225 | 16.1 | 13.8 | 12.5 | 12.6 | 37,063 | 58,164 | 43,366 | 40,629 |
| Total..... | 2,333 | 4,391 | 4,320 | 4,217 | 16.2 | 14.0 | 13.4 | 12.8 | 58,001 | 73,115 | 57,984 | 55,790 |
| EUROPE | | | | | | | | | | | | |
| Norway..... | 37 | 23 | 18 | 631 | 26.3 | 27.9 | 27.6 | 25.9 | 973 | 606 | 497 | 561 |
| Sweden..... | 977 | 683 | 682 | 376 | 24.7 | 26.2 | 22.2 | 25.1 | 24,100 | 15,144 | 17,132 | 16,373 |
| Denmark..... | 636 | 453 | 361 | 376 | 30.0 | 24.6 | 22.9 | 26.8 | 19,104 | 10,364 | 9,683 | 10,226 |
| Netherlands..... | 557 | 499 | 485 | 485 | 29.5 | 31.5 | 27.7 | 35.7 | 16,422 | 15,731 | 13,489 | 13,283 |
| Belgium..... | 672 | 569 | 573 | 567 | 35.2 | 36.8 | 38.1 | 40.5 | 23,644 | 20,564 | 21,854 | 19,865 |
| Luxembourg..... | 26 | 18 | 17 | 18 | 25.0 | 19.4 | 20.8 | 23.5 | 651 | 319 | 352 | 387 |
| France..... | 2,196 | 1,921 | 1,900 | 1,936 | 17.0 | 18.5 | 17.7 | 17.9 | 32,501 | 40,645 | 34,079 | 39,432 |
| Spain..... | 1,988 | 1,802 | 1,818 | 1,633 | 13.9 | 15.4 | 14.6 | 10.4 | 27,636 | 27,721 | 14,413 | 22,896 |
| Portugal..... | 1,271 | 604 | 589 | 489 | 8.8 | 8.8 | 7.6 | 5.8 | 11,200 | 5,330 | 4,677 | 5,320 |
| Italy..... | 346 | 317 | 307 | 311 | 18.3 | 19.8 | 19.3 | 21.0 | 6,317 | 5,937 | 6,315 | 6,822 |
| Switzerland..... | 60 | 48 | 56 | 49 | 29.7 | 32.6 | 32.6 | 35.0 | 1,783 | 1,923 | 1,962 | 1,614 |
| Germany..... | 12,713 | 10,745 | 11,452 | 11,680 | 29.0 | 23.8 | 23.2 | 27.5 | 368,337 | 269,025 | 335,469 | 321,045 |
| Austria..... | 1,110 | 948 | 936 | 936 | 21.4 | 18.3 | 21.2 | 24.3 | 23,785 | 19,126 | 19,920 | 19,023 |
| Czechoslovakia..... | 2,605 | 2,128 | 2,487 | 2,640 | 24.4 | 24.5 | 24.5 | 28.2 | 63,538 | 49,296 | 70,047 | 63,595 |
| Hungary..... | 1,608 | 1,591 | 1,608 | 1,607 | 19.5 | 16.9 | 14.1 | 20.3 | 31,377 | 26,845 | 32,587 | 32,947 |
| Yugoslavia..... | 1,732 | 477 | 516 | 1,600 | 12.3 | 12.6 | 11.5 | 15.2 | 9,004 | 6,001 | 6,923 | 8,269 |
| Greece..... | 76 | 84 | 117 | 144 | 14.9 | 12.5 | 12.9 | 12.6 | 1,129 | 1,051 | 1,751 | 1,267 |
| Bulgaria..... | 542 | 443 | 479 | 525 | 15.4 | 13.2 | 15.0 | 19.2 | 8,345 | 6,931 | 9,220 | 8,558 |
| Rumania..... | 1,266 | 692 | 686 | 766 | 16.1 | 12.1 | 13.4 | 16.7 | 20,644 | 9,323 | 11,453 | 13,084 |
| Poland..... | 12,911 | 14,244 | 13,197 | 14,662 | 18.1 | 16.0 | 16.3 | 18.2 | 215,762 | 206,884 | 240,545 | 246,447 |
| Lithuania..... | 1,719 | 1,355 | 1,113 | 1,113 | 13.9 | 16.9 | 17.1 | 16.1 | 24,283 | 22,942 | 10,158 | 21,046 |
| Latvia..... | 1,838 | 624 | 1,161 | 590 | 14.7 | 15.3 | 16.1 | 13.3 | 13,021 | 9,535 | 8,459 | 9,374 |
| Estonia..... | 486 | 367 | 337 | 329 | 16.7 | 15.9 | 15.4 | 17.5 | 8,129 | 6,246 | 5,537 | 5,748 |
| Finland..... | 589 | 578 | 550 | 556 | 17.8 | 19.6 | 22.7 | 20.0 | 10,440 | 12,892 | 10,939 | 15,128 |
| Russia..... | 61,053 | 59,442 | 63,594 | 556 | 12.0 | 11.4 | 13.7 | 11.9 | 735,505 | 944,607 | 755,831 | 755,831 |

| | | | | | | | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|------|------|------|------|-----------|---------|---------|---------|---------|
| Total European countries re- porting all years..... | 44,868 | 39,710 | 41,311 | 38,940 | 42,204 | 21.7 | 19.4 | 19.3 | 22.5 | 21.2 | 973,223 | 771,168 | 796,714 | 896,934 | 885,340 |
| Estimated European total, ex- cluding Russia..... | 45,200 | 39,200 | 42,000 | 41,000 | 43,000 | | | | | | 978,000 | 781,000 | 813,000 | 901,000 | 902,000 |
| Total Northern Hemisphere countries reporting all years..... | 47,221 | 45,995 | 45,702 | 44,289 | 46,421 | 21.4 | 18.7 | 19.0 | 21.6 | 20.4 | 1,011,410 | 839,169 | 869,829 | 954,915 | 949,130 |
| Estimated total, excluding Rus- sia and China..... | 48,020 | 45,900 | 47,000 | 45,000 | 47,000 | | | | | | 1,023,000 | 870,000 | 903,000 | 965,000 | 962,000 |
| SOUTHERN HEMISPHERE | | | | | | | | | | | | | | | |
| Chile..... | 5 | 4 | 6 | 5 | | 22.2 | 16.0 | 19.5 | 17.4 | | 111 | 64 | 117 | 87 | |
| Argentina..... | 85 | 380 | 535 | 1,194 | 1,281 | 7.5 | 8.1 | 12.4 | 6.4 | 3.7 | 640 | 3,061 | 6,614 | 7,677 | 4,728 |
| Union of South Africa..... | 108 | 2,164 | 107 | | | 6.7 | 5.5 | 5.8 | | | 724 | 2,909 | 6,623 | | |
| Australia..... | 9 | 4 | 3 | 3 | | 12.7 | 12.8 | 15.7 | | | 114 | 51 | 47 | | |
| New Zealand..... | 34 | 1 | 1 | | | 3 28.5 | 23.0 | 16.0 | | | 114 | 23 | 16 | | |
| Estimated world total, exclud- ing Russia and China..... | 48,300 | 46,500 | 48,000 | 47,000 | 49,000 | | | | | | 1,025,000 | 881,000 | 903,000 | 975,000 | 969,000 |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Figures are for crops harvested during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

¹ Where changes of boundary have occurred, averages are for estimates for territory within present boundaries.

² 3-year average.

³ 4-year average.

⁴ The estimate for the 5-year period, 1909-1913, given in this table is somewhat larger than the figures obtained by averaging the 5-years in Table 26. This is because in this table estimates for war-torn countries are for postwar boundaries, whereas in Table 26 they are for pre-war territory. As a result, in excluding Russia, which country lost territory in the war, a smaller area is excluded in this table than in Table 26.

⁵ 2-year average.

TABLE 36.—*Rye: World production, 1894-1929*

| Year | World production excluding Russia and China | Northern Hemisphere production excluding Russia and China | European production excluding Russia | Selected countries | | | | | | |
|------|---|---|--------------------------------------|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | Russia ¹ | United States | Germany | France | Poland | Hungary | Czechoslovakia |
| | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels |
| 1894 | 663 | 662 | 618 | 931 | 30 | 279 | 75 | — | 80 | — |
| 1895 | 620 | 618 | 573 | 773 | 31 | 260 | 72 | — | 47 | — |
| 1896 | 664 | 663 | 621 | 790 | 29 | 285 | 70 | — | 37 | — |
| 1897 | 599 | 598 | 551 | 654 | 33 | 273 | 48 | — | 26 | — |
| 1898 | 667 | 666 | 619 | 738 | 33 | 297 | 67 | — | 33 | — |
| 1899 | 710 | 708 | 664 | 912 | 30 | 342 | 67 | — | 36 | — |
| 1900 | 675 | 673 | 629 | 920 | 51 | 337 | 59 | — | 31 | — |
| 1901 | 690 | 688 | 644 | 755 | 31 | 321 | 58 | — | 31 | — |
| 1902 | 733 | 731 | 682 | 919 | 35 | 374 | 46 | — | 38 | — |
| 1903 | 768 | 767 | 721 | 912 | 32 | 391 | 58 | — | 37 | — |
| 1904 | 755 | 754 | 709 | 1,008 | 32 | 396 | 53 | — | 33 | — |
| 1905 | 782 | 781 | 732 | 737 | 35 | 378 | 59 | — | 38 | — |
| 1906 | 787 | 785 | 736 | 668 | 37 | 379 | 51 | — | 39 | — |
| 1907 | 751 | 749 | 700 | 815 | 35 | 384 | 56 | — | 30 | — |
| 1908 | 827 | 826 | 776 | 790 | 36 | 423 | 52 | — | 34 | — |
| 1909 | 872 | 870 | 821 | 904 | 35 | 447 | 56 | — | 47 | — |
| 1910 | 818 | 816 | 768 | 875 | 35 | 414 | 44 | — | 52 | — |
| 1911 | 828 | 826 | 779 | 769 | 33 | 428 | 47 | — | 54 | — |
| 1912 | 862 | 860 | 810 | 1,051 | 36 | 457 | 49 | — | 57 | — |
| 1913 | 892 | 889 | 834 | 1,011 | 41 | 481 | 50 | — | 56 | — |
| 1914 | 766 | 763 | 707 | ³ 870 | 43 | 347 | 44 | — | 45 | — |
| 1915 | 691 | 689 | 621 | ⁴ 910 | 54 | 301 | 33 | — | 48 | — |
| 1916 | 663 | 661 | 598 | ⁵ 771 | 49 | 297 | 33 | — | — | — |
| 1917 | 548 | 545 | 466 | 614 | 63 | ⁶ 228 | 25 | — | — | — |
| 1918 | 590 | 588 | 476 | — | 91 | 250 | 20 | — | — | — |
| 1919 | 681 | 679 | 581 | — | 75 | 238 | 31 | 103 | — | — |
| 1920 | 610 | 616 | 533 | 368 | 60 | 194 | 37 | 74 | ⁶ 21 | 33 |
| 1921 | 853 | 850 | 760 | 401 | 62 | 268 | 44 | 175 | 23 | 54 |
| 1922 | 864 | 858 | 716 | 568 | 103 | 266 | 38 | 203 | 25 | 51 |
| 1923 | 925 | 919 | 826 | 784 | 63 | 263 | 37 | 243 | 31 | 53 |
| 1924 | 747 | 743 | 657 | 737 | 65 | 226 | 40 | 148 | 22 | 45 |
| 1925 | 1,016 | 1,009 | 946 | 889 | 46 | 317 | 44 | 265 | 33 | 58 |
| 1926 | 821 | 813 | 753 | 826 | 41 | 252 | 50 | 204 | 31 | 46 |
| 1927 | 903 | 893 | 813 | 945 | 58 | 269 | 34 | 232 | 22 | 49 |
| 1928 | 975 | 965 | 901 | 756 | 43 | 335 | 34 | 241 | 35 | 70 |
| 1929 | 969 | 962 | 902 | — | 41 | 321 | 39 | 246 | 33 | 64 |

Bureau of Agricultural Economics. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

¹Includes all Russian territory reporting for the years shown.

²The average production for the 1909-1913 period as computed from figures given here for estimated world total, Northern Hemisphere total, European total and European countries whose boundaries were changed by the World War, will not agree with estimates appearing elsewhere for present territory due to changes in boundary.

³Exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.

⁴Exclusive of Russian Poland, Lithuania, parts of Latvia and the Ukraine, and the two Provinces of Batum and Elizabetpol in Transcaucasia.

⁵Beginning with this year estimates for the present territory of the Union of Socialist Soviet Republics exclusive of Turkestan, Transcaucasia, and the Far East, which territory in 1924 produced 8,646,000 bushels.

⁶Beginning with this year postwar boundaries, therefore not comparable with earlier years.

⁷Preliminary.

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TABLE 37.—Rye: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917-1928

| Year beginning July | Percentage of year's receipts | | | | | | | | | | | |
|---------------------|-------------------------------|------|-------|------|------|------|------|------|------|------|-----|------|
| | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June |
| 1917 | 2.8 | 14.8 | 20.5 | 17.1 | 11.3 | 7.6 | 5.8 | 6.4 | 7.6 | 3.4 | 1.7 | 1.0 |
| 1918 | 5.6 | 11.3 | 14.9 | 14.5 | 12.2 | 9.5 | 8.4 | 4.9 | 6.3 | 4.8 | 3.4 | 4.2 |
| 1919 | 8.2 | 15.0 | 13.3 | 12.4 | 7.8 | 9.1 | 8.5 | 4.7 | 6.2 | 6.4 | 4.3 | 4.1 |
| 1920 | 7.3 | 20.7 | 18.1 | 12.2 | 8.8 | 7.0 | 6.6 | 4.7 | 4.3 | 3.7 | 3.3 | 3.3 |
| 1921 | 13.9 | 20.8 | 17.6 | 10.6 | 6.3 | 5.9 | 4.5 | 4.8 | 4.9 | 4.0 | 4.2 | 2.5 |
| 1922 | 10.7 | 20.5 | 14.8 | 12.3 | 10.2 | 8.7 | 6.5 | 5.3 | 4.0 | 2.9 | 2.2 | 1.9 |
| 1923 | 5.3 | 18.8 | 19.2 | 14.2 | 9.4 | 8.5 | 5.4 | 5.9 | 3.5 | 2.5 | 3.0 | 4.3 |
| 1924 | 3.9 | 16.9 | 25.4 | 23.3 | 10.7 | 7.0 | 5.0 | 3.1 | 1.7 | 1.0 | 1.2 | .8 |
| 1925 | 5.2 | 19.2 | 23.3 | 12.4 | 8.7 | 8.9 | 6.6 | 4.6 | 3.1 | 2.4 | 2.8 | 2.8 |
| 1926 | 8.0 | 20.1 | 19.7 | 13.0 | 8.5 | 6.0 | 6.0 | 6.0 | 3.7 | 2.6 | 3.0 | 3.4 |
| 1927 | 4.7 | 19.0 | 25.6 | 17.5 | 9.8 | 5.8 | 4.4 | 4.1 | 3.7 | 2.4 | 1.7 | 1.3 |
| 1928 | 4.5 | 19.5 | 27.0 | 16.3 | 9.3 | 6.1 | 4.5 | 5.1 | 2.9 | 1.9 | 1.4 | 1.5 |

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TABLE 38.—Rye: Classification of receipts graded by licensed inspectors, all inspection points, 1923-1928

| Year beginning July | Receipts of— | | | | | | Shipments of— | |
|---------------------|--------------|--------|-------|-------|--------------|--------|---------------|--------|
| | No. 1 | No. 2 | No. 3 | No. 4 | Sample grade | Total | Sample grade | Total |
| 1923-24: Cars | 14,394 | 13,532 | 3,872 | 1,061 | 473 | 33,332 | 26 | 30,796 |
| 1924-25: Cars | 27,977 | 24,251 | 8,841 | 2,957 | 876 | 64,902 | 69 | 70,946 |
| 1925-26: Cars | 3,969 | 11,730 | 5,111 | 1,794 | 494 | 23,098 | 30 | 19,133 |
| 1926-27: Cars | 3,492 | 9,921 | 5,794 | 3,597 | 1,445 | 24,649 | 123 | 31,285 |
| 1927-28: Cars | 10,659 | 15,573 | 4,976 | 1,409 | 561 | 33,181 | 22 | 28,060 |
| 1928-29: Cars | 1,787 | 13,081 | 6,646 | 1,994 | 626 | 24,134 | 142 | 15,364 |

Bureau of Agricultural Economics.

TABLE 39.—Rye: Commercial stocks in store, 1926-27 to 1929-30

DOMESTIC RYE IN UNITED STATES¹

| | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June |
|---------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1926-27 | | | | | | | 13,092 | 12,880 | 13,897 | 13,905 | 7,818 | 3,783 |
| 1927-28 | 1,018 | 1,454 | 2,091 | 2,608 | 2,077 | 2,970 | 3,281 | 4,027 | 4,321 | 5,090 | 5,544 | 2,662 |
| 1928-29 | 2,499 | 2,170 | 1,351 | 2,684 | 4,771 | 5,589 | 6,176 | 6,185 | 6,440 | 6,914 | 6,598 | 6,532 |
| 1929-30 | 6,632 | 6,614 | 8,561 | 9,771 | 11,453 | 12,033 | | | | | | |

UNITED STATES RYE IN CANADA

| | 1,465 | 589 | 686 | 1,385 | 1,390 | 1,208 | 930 | 1,704 | 1,583 | 1,384 | 3,379 | 869 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1926-27 | | | | | | | | | | | | |
| 1927-28 | | | | | | | | | | | | |
| 1928-29 | 750 | 449 | 357 | 838 | 1,248 | 1,478 | 1,707 | 1,426 | 1,255 | 1,310 | 1,367 | 1,379 |
| 1929-30 | 1,182 | 1,255 | 1,540 | 2,900 | 2,883 | 2,900 | | | | | | |

CANADIAN RYE IN UNITED STATES¹

| | 63 | 50 | 20 | 124 | 441 | 802 | 2,266 | 1,922 | 1,631 | 494 | 689 | 792 |
|---------|-----|-----|-----|-----|-----|-----|-------|-------|-------|-----|-----|-----|
| 1926-27 | | | | | | | | | | | | |
| 1927-28 | | | | | | | | | | | | |
| 1928-29 | 248 | 255 | 12 | 83 | 265 | 255 | 208 | 532 | 559 | 440 | 451 | 480 |
| 1929-30 | 380 | 394 | 432 | 320 | 429 | 431 | | | | | | |

Bureau of Agricultural Economics. Compiled from weekly reports to the Grain, Hay, and Feed Market News Service. Data are for stocks on the Saturday nearest the 1st day of the month.

¹ Includes rye in store in public and private elevators in 39 important markets and also the rye afloat in vessels or barges in harbors of lake and seaboard ports. Rye in transit either by rail or water, mill stocks or small private stocks of rye intended only for local purposes, not included.

² Includes rye stored at lake and seaboard ports, exclusive of rye in transit on lakes and canals.

TABLE 40.—*Rye: Receipts at specified markets, 1921-1928*

| Year beginning July | Minneapolis | Duluth | Chicago | Milwaukee | Omaha | Total, 5 markets | Port William and Port Arthur ¹ |
|-------------------------|---------------|---------------|---------------|---------------|---------------|------------------|---|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1921..... | 4,754 | 17,414 | 4,235 | 2,282 | 2,048 | 30,763 | 5,297 |
| 1922..... | 15,111 | 42,744 | 7,585 | 3,241 | 1,916 | 70,597 | 11,552 |
| 1923..... | 13,336 | 16,836 | 2,952 | 1,449 | 736 | 35,309 | 6,837 |
| 1924..... | 8,447 | 38,496 | 12,586 | 2,733 | 1,207 | 63,469 | 5,265 |
| 1925..... | 7,872 | 10,907 | 2,429 | 876 | 892 | 22,973 | 5,329 |
| 1926..... | 4,123 | 13,351 | 2,355 | 1,268 | 941 | 22,038 | 7,763 |
| 1927..... | 5,423 | 25,088 | 4,151 | 673 | 1,564 | 36,899 | 11,963 |
| 1928 ² | 7,375 | 10,881 | 5,288 | 1,053 | 1,354 | 25,951 | 8,180 |

Bureau of Agricultural Economics. Compiled from reports of Minneapolis Chamber of Commerce, Duluth Board of Trade, Chicago Board of Trade, Milwaukee Chamber of Commerce, Omaha Grain Exchange, American Elevator and Grain Trade, and Canadian Grain Statistics.

¹ Crop year begins September.

² Figures subject to revision.

TABLE 41.—*Rye, including flour: International trade, average 1910-1914, annual 1926-1929*

| Country | Year ended June 30 | | | | | | | | | |
|--------------------------------------|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|---------------|
| | Average 1910-1914 | | 1926 | | 1927 | | 1928 | | 1929 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| United States..... | 0 | 888 | 0 | 12,617 | 0 | 21,098 | 0 | 26,346 | 0 | 9,488 |
| Russia..... | 15,381 | 133,979 | 0 | 7,094 | 0 | 16,691 | ----- | ----- | ----- | ----- |
| Canada..... | 65 | 58 | 23 | 5,768 | 47 | 8,229 | 114 | 10,379 | ----- | 6,430 |
| Hungary..... | 1140 | 14,150 | 1 | 6,832 | 1 | 10,455 | 1 | 4,431 | 1 | 5,136 |
| Argentina..... | 0 | 2,273 | 0 | 1,812 | 0 | 5,902 | 0 | 7,060 | ----- | ----- |
| Poland..... | ----- | ----- | 2,334 | 11,983 | 4,273 | 5,063 | 4,832 | 375 | 792 | 1,415 |
| Rumania..... | 12,26 | 12,992 | 51 | 105 | 10 | 1,503 | 10 | 12,189 | ----- | ----- |
| Bulgaria..... | 0 | 1,925 | 0 | 59 | 0 | 506 | 0 | 807 | ----- | ----- |
| Yugoslavia..... | 0 | 0 | 0 | 231 | 0 | 1,506 | 0 | 113 | ----- | ----- |
| Algeria..... | 0 | 0 | 0 | 47 | 0 | 28 | 10 | 140 | ----- | ----- |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| Germany..... | 16,226 | 43,936 | 9,149 | 15,963 | 22,797 | 7,876 | 24,861 | 10,199 | 7,235 | 22,965 |
| Finland..... | ----- | ----- | 6,471 | 7 | 5,296 | 10 | 4,932 | 10 | 7,757 | 12 |
| Norway..... | 110,644 | 1,51 | 7,719 | 0 | 7,038 | 0 | 7,307 | 0 | 6,024 | 0 |
| Denmark..... | 18,753 | 1,288 | 8,610 | 425 | 6,550 | 445 | 7,401 | 417 | 7,216 | 392 |
| Netherlands..... | 129,557 | 177,889 | 6,046 | 434 | 4,037 | 840 | 4,148 | 629 | 3,451 | 531 |
| Czechoslovakia..... | 0 | 0 | 8,169 | 102 | 4,631 | 131 | 7,622 | 102 | 2,581 | 1,663 |
| Austria..... | 11,469 | 12 | 4,020 | 162 | 4,277 | 248 | 4,617 | 101 | ----- | ----- |
| Sweden..... | 13,940 | 159 | 1,455 | 98 | 633 | 1,645 | 4,177 | 626 | 4,550 | 290 |
| Latvia..... | 0 | 0 | 2,648 | 166 | 2,043 | 120 | ----- | ----- | ----- | ----- |
| France..... | 3,316 | 26 | 894 | 128 | 5,016 | 1 | 753 | 8 | 571 | 5 |
| United Kingdom..... | 2,120 | 7 | 1,167 | 165 | 792 | 173 | 717 | 83 | ----- | ----- |
| Estonia..... | 0 | 0 | 1,021 | 11 | 1,944 | 0 | 1,085 | 0 | 2,680 | 0 |
| Belgium..... | 5,756 | 880 | 1,913 | 84 | 3,484 | 18 | 753 | 67 | 376 | 33 |
| Italy..... | 654 | 2 | 493 | 24 | 538 | 2 | 107 | 17 | ----- | ----- |
| Switzerland..... | 1728 | 11 | 85 | 0 | 15 | 0 | 53 | 0 | 6 | 0 |
| Total 25 countries..... | 88,774 | 117,356 | 63,169 | 64,237 | 73,412 | 81,990 | 73,480 | 63,909 | 43,240 | 48,330 |

Bureau of Agricultural Economics. Official sources except where otherwise noted.

¹ Year ended July 31, International Yearbook of Agricultural Statistics.

² Average of calendar years, 1909-1913.

³ Average for the seasons 1911-12 to 1913-14.

⁴ International Crop Report and Agricultural Statistics.

⁵ Season 1913-14.

⁶ Year ended June 30, International Yearbook of Agricultural Statistics.

⁷ Year ended Dec. 31.

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TABLE 42.—*Rye: Estimated average price per bushel, received by producers, United States, 1909-1929*

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weight- ed aver- age |
|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909 | 80.1 | 75.4 | 72.0 | 73.2 | 72.7 | 73.3 | 75.4 | 76.3 | 76.6 | 75.8 | 71.8 | 74.7 | 74.6 |
| 1910 | 74.5 | 74.2 | 73.4 | 72.2 | 71.6 | 72.4 | 83.2 | 72.5 | 73.6 | 75.6 | 76.8 | 77.4 | 73.4 |
| 1911 | 76.2 | 76.2 | 78.3 | 81.4 | 83.2 | 83.0 | 83.6 | 84.2 | 84.6 | 84.8 | 85.1 | 84.8 | 81.0 |
| 1912 | 80.8 | 74.4 | 70.4 | 69.4 | 67.6 | 65.0 | 66.4 | 66.0 | 63.0 | 62.6 | 63.2 | 63.6 | 68.7 |
| 1913 | 62.0 | 61.8 | 63.9 | 64.0 | 63.3 | 63.0 | 62.1 | 61.8 | 62.4 | 63.0 | 63.6 | 63.8 | 62.9 |
| 1914 | 62.0 | 68.2 | 77.2 | 79.6 | 83.3 | 88.4 | 95.4 | 103.0 | 102.9 | 101.2 | 100.0 | 95.9 | 83.3 |
| 1915 | 91.4 | 87.2 | 83.6 | 83.7 | 84.6 | 84.4 | 86.8 | 87.0 | 84.6 | 83.6 | 83.8 | 83.6 | 85.0 |
| 1916 | 83.4 | 91.6 | 101.9 | 103.7 | 118.7 | 120.3 | 121.0 | 124.8 | 130.8 | 149.8 | 173.6 | 180.0 | 113.0 |
| 1917 | 177.6 | 170.6 | 165.8 | 169.3 | 167.4 | 168.2 | 172.6 | 187.9 | 218.0 | 228.1 | 204.4 | 178.8 | 176.1 |
| 1918 | 146.9 | 141.6 | 156.6 | 153.3 | 152.1 | 151.2 | 145.6 | 136.3 | 139.0 | 150.6 | 149.6 | 141.2 | 152.1 |
| 1919 | 144.2 | 144.0 | 137.0 | 132.8 | 131.6 | 142.8 | 153.4 | 149.8 | 150.6 | 169.6 | 185.5 | 186.4 | 146.9 |
| 1920 | 178.8 | 168.8 | 165.6 | 152.2 | 134.4 | 125.8 | 128.1 | 128.8 | 122.4 | 112.0 | 108.8 | 108.0 | 148.2 |
| 1921 | 101.0 | 94.0 | 89.2 | 81.6 | 72.2 | 69.6 | 70.0 | 77.0 | 83.8 | 85.9 | 87.8 | 82.8 | 86.0 |
| 1922 | 74.0 | 66.9 | 63.2 | 65.2 | 68.2 | 70.7 | 71.7 | 71.0 | 70.1 | 70.8 | 69.2 | 62.2 | 68.1 |
| 1923 | 56.3 | 55.3 | 57.2 | 58.8 | 62.1 | 63.9 | 63.5 | 64.5 | 62.8 | 60.4 | 60.1 | 61.6 | 59.4 |
| 1924 | 68.8 | 79.8 | 80.1 | 105.7 | 108.6 | 112.7 | 126.2 | 132.2 | 125.1 | 100.9 | 103.6 | 101.8 | 96.3 |
| 1925 | 92.3 | 92.8 | 81.9 | 74.1 | 73.4 | 86.8 | 88.2 | 82.5 | 73.4 | 73.8 | 72.5 | 76.0 | 83.1 |
| 1926 | 80.7 | 86.1 | 81.6 | 82.4 | 83.0 | 82.4 | 83.6 | 88.4 | 86.4 | 85.2 | 90.1 | 94.9 | 84.2 |
| 1927 | 91.2 | 80.6 | 81.4 | 81.0 | 84.0 | 87.8 | 88.0 | 89.5 | 96.0 | 90.8 | 111.5 | 106.8 | 84.7 |
| 1928 | 99.2 | 83.6 | 81.8 | 87.1 | 86.3 | 87.2 | 87.9 | 91.5 | 91.5 | 86.0 | 79.1 | 75.7 | 86.4 |
| 1929 | 85.3 | 91.8 | 89.2 | 89.9 | 85.5 | 88.4 | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of rye for each State; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1909-December, 1923.

TABLE 43.—*Rye No. 2: Weighted average price¹ per bushel of reported cash sales, Minneapolis, 1909-1929*

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Weight- ed aver- age ¹ |
|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909 | 76 | 67 | 66 | 68 | 69 | 72 | 77 | 76 | 74 | 73 | 71 | 69 | 70 |
| 1910 | 73 | 73 | 71 | 72 | 74 | 77 | 79 | 78 | 84 | 88 | 101 | 87 | 77 |
| 1911 | 79 | 80 | 85 | 92 | 88 | 87 | 90 | 88 | 89 | 89 | 87 | 79 | 86 |
| 1912 | 69 | 64 | 62 | 63 | 58 | 56 | 58 | 57 | 55 | 57 | 57 | 56 | 60 |
| 1913 | 57 | 61 | 61 | 56 | 54 | 55 | 55 | 56 | 56 | 57 | 60 | 59 | 58 |
| 1914 | 58 | 80 | 89 | 87 | 101 | 100 | 115 | 124 | 112 | 111 | 116 | 112 | 98 |
| 1915 | 102 | 97 | 90 | 96 | 93 | 92 | 96 | 95 | 89 | 93 | 94 | 94 | 94 |
| 1916 | 93 | 115 | 120 | 126 | 144 | 138 | 142 | 142 | 158 | 180 | 228 | 237 | 135 |
| 1917 | 220 | 175 | 184 | 181 | 177 | 183 | 193 | 224 | 291 | 274 | 230 | 185 | 193 |
| 1918 | 184 | 168 | 160 | 158 | 162 | 157 | 154 | 134 | 154 | 171 | 155 | 145 | 158 |
| 1919 | 154 | 148 | 139 | 136 | 138 | 166 | 173 | 153 | 170 | 195 | 208 | 214 | 160 |
| 1920 | 209 | 182 | 185 | 166 | 149 | 149 | 158 | 141 | 142 | 128 | 137 | 126 | 161 |
| 1921 | 115 | 100 | 99 | 80 | 72 | 79 | 75 | 95 | 97 | 97 | 102 | 86 | 92 |
| 1922 | 76 | 69 | 66 | 71 | 81 | 83 | 82 | 80 | 76 | 81 | 72 | 64 | 75 |
| 1923 | 61 | 62 | 66 | 66 | 64 | 65 | 67 | 66 | 63 | 61 | 63 | 70 | 65 |
| 1924 | 83 | 86 | 95 | 121 | 123 | 133 | 154 | 154 | 130 | 106 | 114 | 111 | 114 |
| 1925 | 95 | 100 | 83 | 77 | 81 | 98 | 99 | 91 | 81 | 85 | 83 | 89 | 88 |
| 1926 | 102 | 97 | 93 | 95 | 94 | 94 | 99 | 102 | 99 | 99 | 109 | 111 | 98 |
| 1927 | 104 | 92 | 92 | 92 | 99 | 102 | 103 | 106 | 114 | 124 | 128 | 123 | 104 |
| 1928 | 111 | 94 | 94 | 94 | 98 | 97 | 101 | 105 | 100 | 89 | 85 | 84 | 95 |
| 1929 | 107 | 98 | 97 | 97 | 96 | 98 | | | | | | | |

Bureau of Agricultural Economics. Compiled from Minneapolis Daily Market Record. Chicago prices, 1900-1927 appear in Table 46, 1927 Yearbook.

¹ Average of daily prices weighted by car-lot sales.

TABLE 44.—*Corn: Acreage, production, value, exports, etc., United States, 1890-1929*

| Year | Acreage | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Price per bushel at Chicago ¹ | Foreign trade, including meal, year beginning July 1 | | | |
|-------------------------|-------------|----------------------------|---------------|---|-------------------|--|--|---------------|--------------------------|--------------------------|
| | | | | | | | Domestic exports | Imports | Net exports ² | |
| | | | | | | | | | Total | Percentage of production |
| | 1,000 acres | Bushels of 56 lbs. shelled | 1,000 bushels | Cents | 1,000 dollars | Cents | 1,000 bushels | 1,000 bushels | 1,000 bushels | Per cent |
| 1890..... | 70,390 | 20.7 | 1,460,406 | 50.0 | 729,647 | 58 | 32,042 | 2 | 32,039 | 2.2 |
| 1891..... | 74,496 | 27.6 | 2,055,823 | 39.7 | 816,917 | 47 | 76,602 | 16 | 76,586 | 3.7 |
| 1892..... | 72,610 | 23.6 | 1,713,688 | 38.8 | 664,390 | 41 | 47,122 | 2 | 47,120 | 2.7 |
| 1893..... | 74,434 | 22.9 | 1,707,572 | 35.9 | 612,998 | 41 | 66,490 | 3 | 66,487 | 3.9 |
| 1894..... | 69,396 | 19.3 | 1,339,680 | 45.1 | 604,523 | 44 | 28,585 | 17 | 28,568 | 2.1 |
| 1895..... | 85,567 | 27.0 | 2,310,952 | 25.0 | 578,408 | 26 | 101,100 | 5 | 101,096 | 4.4 |
| 1896..... | 86,560 | 28.9 | 2,503,484 | 21.3 | 532,884 | 25 | 178,817 | 7 | 178,811 | 7.1 |
| 1897..... | 88,127 | 24.3 | 2,144,553 | 26.0 | 558,309 | 30 | 212,056 | 4 | 212,052 | 9.9 |
| 1898..... | 88,304 | 25.6 | 2,261,119 | 28.4 | 642,747 | 34 | 177,255 | 4 | 177,252 | 7.8 |
| 1899..... | 94,914 | 28.1 | 2,666,324 | | | | | | | |
| 1899..... | 94,914 | 25.9 | 2,454,628 | 29.9 | 734,916 | 36 | 213,123 | 3 | 213,121 | 8.7 |
| 1900..... | 95,042 | 26.4 | 2,505,148 | 35.1 | 878,243 | 43 | 181,405 | 5 | 181,400 | 7.2 |
| 1901..... | 94,636 | 17.0 | 1,613,528 | 60.1 | 969,285 | 62 | 28,029 | 19 | 28,011 | 1.7 |
| 1902..... | 95,517 | 27.4 | 2,619,499 | 40.1 | 1,049,791 | 47 | 76,639 | 41 | 76,598 | 2.9 |
| 1903..... | 90,661 | 25.9 | 2,346,897 | 42.1 | 987,882 | 49 | 58,222 | 17 | 58,210 | 2.5 |
| 1904..... | 93,340 | 27.1 | 2,528,662 | 43.7 | 1,105,690 | 48 | 90,293 | 10 | 90,278 | 3.6 |
| 1905..... | 93,573 | 29.4 | 2,748,949 | 40.8 | 1,120,513 | 44 | 119,894 | 11 | 119,883 | 4.4 |
| 1906..... | 93,643 | 30.9 | 2,897,662 | 39.3 | 1,138,053 | 50 | 86,368 | 11 | 86,358 | 3.0 |
| 1907..... | 94,971 | 26.5 | 2,512,065 | 50.9 | 1,277,607 | 68 | 55,064 | 20 | 55,044 | 2.2 |
| 1908..... | 95,603 | 26.6 | 2,544,957 | 60.0 | 1,527,679 | 65 | 37,665 | 258 | 37,437 | 1.5 |
| 1909..... | 98,383 | 25.9 | 2,552,190 | | | | | | | |
| 1909..... | 98,383 | 26.1 | 2,572,336 | 58.6 | 1,507,185 | 59 | 38,128 | 118 | 38,010 | 1.5 |
| 1910..... | 104,035 | 27.7 | 2,886,260 | 48.0 | 1,384,817 | 53 | 65,615 | 53 | 65,562 | 2.3 |
| 1911..... | 105,825 | 23.9 | 2,531,488 | 61.8 | 1,565,258 | 71 | 41,797 | 54 | 41,744 | 1.6 |
| 1912..... | 107,083 | 29.2 | 3,124,746 | 48.7 | 1,520,454 | 53 | 50,780 | 903 | 49,913 | 1.6 |
| 1913..... | 105,820 | 23.1 | 2,446,988 | 69.1 | 1,692,092 | 70 | 10,726 | 12,368 | 1,639 | |
| 1914..... | 103,435 | 25.8 | 2,672,804 | 64.4 | 1,722,070 | 70 | 50,668 | 9,899 | 40,816 | 1.5 |
| 1915..... | 106,197 | 28.2 | 2,994,793 | 57.5 | 1,722,680 | 79 | 39,897 | 5,211 | 34,761 | 1.2 |
| 1916..... | 105,296 | 24.4 | 2,566,927 | 88.9 | 2,280,729 | 111 | 66,753 | 2,270 | 65,092 | 2.5 |
| 1917..... | 116,730 | 26.3 | 3,065,233 | 127.9 | 3,920,228 | 163 | 49,073 | 3,197 | 45,950 | 1.5 |
| 1918..... | 104,467 | 24.0 | 2,502,665 | 136.5 | 3,416,240 | 162 | 23,019 | 3,346 | 19,684 | .8 |
| 1919 ³ | 87,772 | 26.7 | 2,346,833 | | | | | | | |
| 1919..... | 97,170 | 28.9 | 2,811,302 | 134.5 | 3,780,597 | 159 | 16,729 | 10,283 | 6,509 | .2 |
| 1920..... | 101,699 | 31.5 | 3,208,584 | 67.0 | 2,150,332 | 62 | 70,906 | 5,791 | 66,116 | 2.1 |
| 1921..... | 103,740 | 29.6 | 3,068,569 | 42.3 | 1,297,213 | 55 | 179,490 | 142 | 179,374 | 5.8 |
| 1922..... | 102,846 | 28.3 | 2,906,020 | 68.8 | 1,910,775 | 73 | 96,596 | 182 | 96,415 | 3.3 |
| 1923..... | 104,324 | 29.3 | 3,053,557 | 72.6 | 2,217,229 | 88 | 23,135 | 240 | 22,896 | .7 |
| 1924 ⁴ | 82,329 | 22.2 | 1,823,880 | | | | | | | |
| 1921..... | 100,863 | 22.9 | 2,309,414 | 98.2 | 2,268,771 | 106 | 9,791 | 4,618 | 5,348 | .2 |
| 1925..... | 101,302 | 28.8 | 2,916,106 | 67.4 | 1,966,162 | 75 | 24,783 | 637 | 24,150 | .8 |
| 1926..... | 99,615 | 27.0 | 2,691,531 | 64.2 | 1,728,970 | 87 | 19,819 | 1,098 | 18,731 | .7 |
| 1927..... | 98,393 | 28.1 | 2,763,093 | 72.3 | 1,997,759 | 101 | 19,409 | 5,463 | 14,364 | .5 |
| 1928..... | 100,673 | 28.0 | 2,818,901 | 75.2 | 2,119,046 | 92 | 41,880 | 490 | 41,393 | 1.5 |
| 1929 ⁵ | 98,018 | 26.8 | 2,622,189 | 78.1 | 2,048,134 | | | | | |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board and relate to equivalent production of grain on entire acreage grown for all purposes; italic figures are census returns. See 1927 Yearbook, page 774, for data for earlier years.

¹ Prices 1890-1898 are averages of the weekly quotations for No. 2 or better in annual reports of Chicago Board of Trade; subsequently prices are compiled from the Chicago Daily Trade Bulletin, average of daily prices weighted by car-lot sales, No. 3 yellow.

² Compiled from Commerce and Navigation of the United States, 1890-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1928; January and June issues, 1927-1929 and official records of the Bureau of Foreign and Domestic Commerce. Corn—General imports 1890-909 and 1912-1929; imports for consumption 1910-11. Corn meal—Imports for consumption, 1890-1929. Corn meal converted to terms of grain on the basis that 1 barrel is the product of 4 bushels of corn.

³ Total exports (domestic plus foreign) minus total imports.

⁴ Net imports, i. e., total imports minus total exports (domestic and foreign).

⁵ Corn harvested for grain; total acreage of corn in 1924 is 98,401,627 acres.

⁶ Preliminary.

STATISTICS OF GRAINS

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TABLE 45.—*Corn: Acreage and production, by States, average 1923-1927, annual 1926-1929*

| State and division | Acreage | | | | | Production | | | | |
|---------------------|--------------------------|----------------|----------------|----------------|----------------|----------------------|------------------|------------------|------------------|------------------|
| | Average 1923- 1927 | 1926 | 1927 | 1928 | 1929 1 | Average 1923-1927 | 1926 | 1927 | 1928 | 1929 1 |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Maine..... | 14 | 13 | 14 | 13 | 13 | 543 | 455 | 518 | 520 | 620 |
| New Hampshire..... | 17 | 15 | 15 | 14 | 14 | 745 | 645 | 615 | 560 | 674 |
| Vermont..... | 86 | 84 | 84 | 80 | 88 | 3,690 | 3,612 | 3,276 | 3,520 | 3,608 |
| Massachusetts..... | 48 | 45 | 46 | 45 | 42 | 2,114 | 1,989 | 1,886 | 1,890 | 1,638 |
| Rhode Island..... | 10 | 9 | 10 | 10 | 10 | 386 | 369 | 380 | 390 | 420 |
| Connecticut..... | 58 | 54 | 55 | 55 | 55 | 2,482 | 2,268 | 2,090 | 2,310 | 2,365 |
| New York..... | 692 | 670 | 663 | 650 | 676 | 23,689 | 23,450 | 22,542 | 22,100 | 21,024 |
| New Jersey..... | 199 | 188 | 179 | 181 | 183 | 8,445 | 8,648 | 7,160 | 6,968 | 6,588 |
| Pennsylvania..... | 1,386 | 1,394 | 1,270 | 1,283 | 1,309 | 57,760 | 57,154 | 50,163 | 50,037 | 46,470 |
| North Atlantic..... | 2,500 | 2,472 | 2,336 | 2,331 | 2,300 | 99,854 | 98,581 | 88,632 | 88,295 | 83,207 |
| Ohio..... | 3,608 | 3,591 | 3,376 | 3,646 | 3,518 | 137,122 | 147,231 | 109,720 | 136,725 | 128,407 |
| Indiana..... | 4,600 | 4,672 | 4,205 | 4,483 | 4,121 | 163,952 | 177,536 | 132,458 | 157,802 | 131,968 |
| Illinois..... | 9,002 | 9,205 | 8,469 | 9,570 | 8,900 | 320,656 | 322,175 | 354,070 | 367,488 | 311,500 |
| Michigan..... | 1,590 | 1,593 | 1,418 | 1,461 | 1,344 | 52,578 | 54,162 | 38,995 | 48,944 | 32,928 |
| Wisconsin..... | 2,168 | 2,119 | 2,100 | 2,121 | 2,086 | 76,626 | 73,106 | 68,250 | 89,082 | 81,440 |
| Minnesota..... | 4,309 | 4,343 | 4,172 | 4,089 | 4,253 | 140,512 | 147,662 | 127,246 | 139,026 | 148,855 |
| Iowa..... | 10,999 | 11,170 | 10,901 | 11,202 | 10,944 | 411,446 | 435,630 | 386,986 | 464,883 | 437,760 |
| Missouri..... | 6,374 | 6,471 | 5,796 | 6,260 | 5,384 | 178,203 | 176,011 | 168,084 | 181,540 | 126,524 |
| North Dakota..... | 1,037 | 1,009 | 959 | 907 | 1,057 | 24,708 | 18,162 | 23,975 | 24,426 | 16,384 |
| South Dakota..... | 4,557 | 4,630 | 4,655 | 4,469 | 4,916 | 108,883 | 83,340 | 134,995 | 93,849 | 112,085 |
| Nebraska..... | 8,772 | 8,994 | 8,805 | 8,937 | 9,144 | 226,251 | 139,407 | 201,446 | 212,701 | 237,744 |
| Kansas..... | 5,947 | 5,563 | 5,897 | 6,634 | 6,103 | 120,170 | 61,193 | 176,910 | 179,118 | 106,802 |
| North Central..... | 62,062 | 63,360 | 60,753 | 63,869 | 61,723 | 1,961,107 | 1,835,615 | 1,913,135 | 2,005,584 | 1,872,397 |
| Delaware..... | 146 | 138 | 135 | 136 | 132 | 4,760 | 4,278 | 4,725 | 4,488 | 4,224 |
| Maryland..... | 558 | 554 | 515 | 530 | 525 | 22,241 | 22,049 | 22,660 | 19,345 | 19,162 |
| Virginia..... | 1,683 | 1,694 | 1,626 | 1,626 | 1,522 | 43,704 | 46,585 | 47,967 | 44,715 | 44,138 |
| West Virginia..... | 504 | 485 | 441 | 459 | 441 | 16,533 | 16,005 | 14,774 | 16,524 | 13,892 |
| North Carolina..... | 2,410 | 2,376 | 2,352 | 2,305 | 2,259 | 50,114 | 52,272 | 53,626 | 42,642 | 48,568 |
| South Carolina..... | 1,627 | 1,426 | 1,497 | 1,422 | 1,422 | 23,901 | 22,103 | 25,449 | 17,064 | 23,321 |
| Georgia..... | 3,923 | 3,817 | 3,893 | 3,620 | 3,656 | 49,290 | 55,346 | 54,502 | 38,010 | 50,453 |
| Florida..... | 625 | 551 | 573 | 607 | 625 | 8,443 | 7,714 | 7,449 | 7,891 | 8,438 |
| South Atlantic..... | 11,476 | 11,041 | 11,032 | 10,705 | 10,582 | 218,986 | 226,352 | 231,152 | 190,679 | 212,196 |
| Kentucky..... | 3,107 | 3,000 | 2,885 | 3,029 | 2,938 | 86,432 | 101,277 | 75,010 | 66,638 | 80,795 |
| Tennessee..... | 3,065 | 3,099 | 2,944 | 2,915 | 2,944 | 71,942 | 85,222 | 70,656 | 56,842 | 73,600 |
| Alabama..... | 2,894 | 2,825 | 2,800 | 2,650 | 2,676 | 41,735 | 45,765 | 44,800 | 30,475 | 37,464 |
| Mississippi..... | 2,076 | 1,918 | 1,918 | 1,765 | 1,765 | 33,435 | 36,826 | 34,140 | 24,710 | 35,300 |
| Arkansas..... | 2,009 | 2,026 | 1,925 | 2,002 | 1,882 | 34,126 | 41,533 | 36,675 | 34,034 | 26,348 |
| Louisiana..... | 1,273 | 1,127 | 1,161 | 1,242 | 1,180 | 20,233 | 19,722 | 20,318 | 21,114 | 21,476 |
| Oklahoma..... | 2,843 | 2,353 | 3,177 | 3,050 | 3,020 | 51,203 | 61,178 | 84,190 | 70,150 | 48,320 |
| Texas..... | 4,187 | 3,844 | 6,189 | 4,722 | 4,533 | 81,386 | 106,863 | 119,347 | 99,162 | 86,127 |
| South Central..... | 21,454 | 20,261 | 21,099 | 21,375 | 20,938 | 420,583 | 498,386 | 485,036 | 403,125 | 409,430 |
| Montana..... | 370 | 369 | 305 | 274 | 301 | 6,950 | 3,949 | 7,168 | 5,206 | 3,612 |
| Idaho..... | 72 | 66 | 76 | 53 | 64 | 2,822 | 2,706 | 3,116 | 2,438 | 1,944 |
| Wyoming..... | 175 | 176 | 176 | 167 | 177 | 3,529 | 3,520 | 3,520 | 2,672 | 2,832 |
| Colorado..... | 1,409 | 1,398 | 1,284 | 1,438 | 1,366 | 20,593 | 0,786 | 19,902 | 18,694 | 23,222 |
| New Mexico..... | 201 | 221 | 166 | 199 | 209 | 3,529 | 4,420 | 2,490 | 3,482 | 4,180 |
| Arizona..... | 37 | 40 | 44 | 39 | 41 | 1,043 | 1,120 | 1,408 | 1,014 | 1,148 |
| Utah..... | 20 | 18 | 19 | 18 | 19 | 400 | 432 | 513 | 522 | 569 |
| Nevada..... | 2 | 2 | 2 | 2 | 2 | 43 | 48 | 50 | 44 | 56 |
| Washington..... | 53 | 49 | 43 | 46 | 48 | 1,873 | 1,715 | 1,591 | 1,794 | 1,824 |
| Oregon..... | 71 | 75 | 81 | 82 | 86 | 2,347 | 2,475 | 2,916 | 2,952 | 3,010 |
| California..... | 89 | 77 | 77 | 75 | 82 | 2,992 | 2,426 | 2,464 | 2,400 | 2,542 |
| Far Western..... | 2,499 | 2,481 | 2,273 | 2,393 | 2,385 | 46,210 | 32,507 | 45,138 | 41,218 | 44,959 |
| United States..... | 100,899 | 99,615 | 98,393 | 100,673 | 98,018 | 2,746,740 | 2,691,531 | 2,763,063 | 2,818,901 | 2,622,189 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

1 Preliminary.

TABLE 46.—*Corn: Utilization for grain, silage, hogging down, grazing, and forage, by States, 1928 and 1929*

| State and division | 1928 | | | | | 1929 | | | | |
|---------------------|-------------|---------------|-------------|------------|---|-------------|---------------|-------------|------------|---|
| | For grain | | For silage | | Hogging down, grazing, and forage acreage | For grain | | For silage | | Hogging down, grazing, and forage acreage |
| | Acreage | Production | Acreage | Production | | Acreage | Production | Acreage | Production | |
| | 1,000 acres | 1,000 bushels | 1,000 acres | 1,000 tons | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 acres | 1,000 tons | 1,000 acres |
| Maine..... | 1 | 40 | 9 | 94 | 3 | 1 | 40 | 9 | 90 | 3 |
| New Hampshire..... | 3 | 120 | 9 | 104 | 2 | 3 | 123 | 9 | 108 | 2 |
| Vermont..... | 8 | 352 | 60 | 690 | 12 | 10 | 410 | 64 | 640 | 14 |
| Massachusetts..... | 11 | 462 | 27 | 310 | 7 | 10 | 390 | 25 | 275 | 7 |
| Rhode Island..... | 3 | 117 | 5 | 55 | 2 | 3 | 126 | 5 | 55 | 2 |
| Connecticut..... | 21 | 882 | 30 | 315 | 4 | 21 | 903 | 30 | 345 | 4 |
| New York..... | 165 | 5,610 | 348 | 3,062 | 137 | 170 | 5,287 | 355 | 3,018 | 151 |
| New Jersey..... | 143 | 5,506 | 29 | 261 | 9 | 143 | 5,148 | 30 | 255 | 10 |
| Pennsylvania..... | 982 | 38,288 | 184 | 1,380 | 117 | 1,001 | 35,536 | 203 | 1,441 | 105 |
| North Atlantic..... | 1,337 | 51,387 | 701 | 6,271 | 293 | 1,362 | 47,963 | 730 | 6,227 | 298 |
| Ohio..... | 3,135 | 117,562 | 227 | 1,771 | 284 | 2,956 | 109,372 | 253 | 1,771 | 309 |
| Indiana..... | 3,729 | 134,244 | 175 | 1,312 | 579 | 3,410 | 110,825 | 172 | 1,204 | 542 |
| Illinois..... | 8,527 | 330,848 | 326 | 2,282 | 717 | 7,906 | 280,663 | 349 | 2,443 | 645 |
| Michigan..... | 794 | 27,790 | 365 | 2,502 | 302 | 635 | 16,510 | 383 | 1,915 | 326 |
| Wisconsin..... | 888 | 38,184 | 978 | 7,628 | 255 | 870 | 36,105 | 949 | 7,118 | 217 |
| Minnesota..... | 2,391 | 83,685 | 438 | 3,022 | 1,260 | 2,598 | 93,528 | 420 | 2,814 | 1,235 |
| Iowa..... | 9,725 | 403,588 | 253 | 2,075 | 1,224 | 9,504 | 380,160 | 240 | 1,872 | 1,200 |
| Missouri..... | 5,838 | 169,302 | 67 | 436 | 355 | 4,936 | 115,996 | 58 | 348 | 390 |
| North Dakota..... | 218 | 5,559 | 69 | 242 | 710 | 3 | 3,894 | 83 | 193 | 738 |
| South Dakota..... | 2,879 | 61,898 | 72 | 346 | 1,518 | 3,248 | 75,678 | 74 | 323 | 1,594 |
| Nebraska..... | 7,559 | 179,904 | 43 | 202 | 1,335 | 7,792 | 202,592 | 44 | 233 | 1,308 |
| Kansas..... | 6,141 | 165,807 | 104 | 582 | 389 | 5,444 | 95,270 | 114 | 570 | 545 |
| North Central..... | 51,824 | 1,718,371 | 3,117 | 22,490 | 8,928 | 49,535 | 1,520,593 | 3,139 | 20,894 | 9,049 |
| Delaware..... | 132 | 4,356 | 3 | 24 | 1 | 128 | 4,096 | 3 | 22 | 1 |
| Maryland..... | 487 | 17,776 | 27 | 189 | 16 | 482 | 17,593 | 27 | 162 | 16 |
| Virginia..... | 1,531 | 42,102 | 61 | 488 | 34 | 1,424 | 41,296 | 64 | 512 | 34 |
| West Virginia..... | 422 | 15,192 | 24 | 158 | 13 | 409 | 12,884 | 20 | 130 | 12 |
| North Carolina..... | 2,207 | 40,830 | 14 | 70 | 84 | 2,161 | 46,462 | 14 | 91 | 84 |
| South Carolina..... | 1,365 | 16,380 | 7 | 28 | 50 | 1,365 | 22,386 | 7 | 21 | 50 |
| Georgia..... | 3,534 | 37,107 | 9 | 32 | 77 | 3,571 | 49,280 | 10 | 30 | 75 |
| Florida..... | 594 | 7,722 | 2 | 11 | 11 | 612 | 8,262 | 2 | 11 | 11 |
| South Atlantic..... | 10,272 | 181,465 | 147 | 1,000 | 286 | 10,152 | 202,259 | 147 | 982 | 283 |
| Kentucky..... | 2,820 | 62,040 | 44 | 308 | 165 | 2,747 | 75,542 | 46 | 322 | 145 |
| Tennessee..... | 2,760 | 53,829 | 30 | 150 | 125 | 2,788 | 69,700 | 30 | 180 | 126 |
| Alabama..... | 2,560 | 29,440 | 5 | 16 | 85 | 2,590 | 36,260 | 5 | 18 | 81 |
| Mississippi..... | 1,627 | 22,778 | 14 | 66 | 124 | 1,639 | 32,780 | 14 | 70 | 112 |
| Arkansas..... | 1,912 | 32,504 | 5 | 25 | 85 | 1,796 | 25,144 | 6 | 21 | 80 |
| Louisiana..... | 1,191 | 20,247 | 10 | 50 | 41 | 1,130 | 20,560 | 11 | 50 | 39 |
| Oklahoma..... | 2,988 | 68,678 | 10 | 55 | 54 | 2,954 | 47,264 | 12 | 55 | 54 |
| Texas..... | 4,626 | 97,146 | 9 | 36 | 87 | 4,413 | 83,847 | 11 | 42 | 109 |
| South Central..... | 20,482 | 386,653 | 127 | 706 | 766 | 20,057 | 391,103 | 135 | 758 | 746 |
| Montana..... | 84 | 1,596 | 9 | 34 | 181 | 76 | 912 | 8 | 20 | 217 |
| Idaho..... | 32 | 1,472 | 9 | 81 | 12 | 33 | 1,221 | 9 | 86 | 12 |
| Wyoming..... | 107 | 1,926 | 4 | 18 | 56 | 116 | 1,972 | 4 | 20 | 57 |
| Colorado..... | 1,007 | 13,594 | 57 | 342 | 374 | 936 | 16,380 | 50 | 325 | 380 |
| New Mexico..... | 165 | 2,970 | 7 | 28 | 27 | 183 | 3,660 | 7 | 35 | 19 |
| Arizona..... | 26 | 676 | 4 | 28 | 9 | 29 | 812 | 4 | 28 | 8 |
| Utah..... | 9 | 270 | 4 | 31 | 5 | 9 | 288 | 5 | 43 | 5 |
| Nevada..... | 1 | 23 | 1 | 7 | 0 | 1 | 28 | 1 | 8 | 0 |
| Washington..... | 20 | 780 | 16 | 144 | 10 | 20 | 760 | 17 | 162 | 11 |
| Oregon..... | 45 | 1,665 | 28 | 196 | 9 | 48 | 1,776 | 28 | 190 | 10 |
| California..... | 37 | 1,221 | 20 | 200 | 18 | 44 | 1,408 | 20 | 220 | 18 |
| Far western..... | 1,533 | 26,193 | 159 | 1,112 | 701 | 1,495 | 29,217 | 153 | 1,137 | 737 |
| United States..... | 85,448 | 2,364,069 | 4,251 | 31,679 | 10,974 | 82,601 | 2,191,135 | 4,304 | 29,908 | 11,113 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

STATISTICS OF GRAINS

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TABLE 47.—*Corn: Yield per acre and estimated price per bushel, December 1, by States, averages, and annual 1924-1929*

| State and division | Yield per acre | | | | | | | Estimated price per bushel | | | | | | |
|---------------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Average, 1918-1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Average, 1923-1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| Maine..... | 43.4 | 43.0 | 45.0 | 35.0 | 37.0 | 40.0 | 40.0 | 114 | 136 | 112 | 100 | 110 | 115 | 120 |
| New Hampshire..... | 45.6 | 48.0 | 50.0 | 43.0 | 41.0 | 40.0 | 41.0 | 110 | 134 | 100 | 100 | 105 | 120 | 110 |
| Vermont..... | 44.4 | 47.0 | 48.0 | 43.0 | 39.0 | 41.0 | 41.0 | 108 | 118 | 100 | 95 | 105 | 110 | 105 |
| Massachusetts..... | 45.5 | 45.0 | 50.0 | 44.0 | 41.0 | 42.0 | 39.0 | 118 | 129 | 110 | 115 | 120 | 130 | 135 |
| Rhode Island..... | 41.7 | 40.0 | 45.0 | 41.0 | 38.0 | 39.0 | 42.0 | 122 | 140 | 120 | 115 | 120 | 135 | 140 |
| Connecticut..... | 45.1 | 43.0 | 50.0 | 42.0 | 38.0 | 42.0 | 43.0 | 114 | 120 | 110 | 115 | 120 | 130 | 110 |
| New York..... | 37.2 | 34.0 | 36.0 | 35.0 | 34.0 | 34.0 | 31.0 | 99 | 117 | 97 | 86 | 96 | 90 | 103 |
| New Jersey..... | 42.6 | 34.0 | 52.0 | 46.0 | 40.0 | 38.5 | 36.0 | 96 | 116 | 73 | 80 | 85 | 97 | 101 |
| Pennsylvania..... | 43.2 | 36.5 | 51.0 | 41.0 | 39.5 | 39.0 | 35.5 | 92 | 118 | 80 | 78 | 91 | 93 | 100 |
| North Atlantic..... | 41.6 | 36.3 | 46.8 | 39.9 | 37.9 | 37.9 | 34.8 | 95.1 | 118.2 | 85.3 | 82.7 | 93.9 | 97.7 | 102.4 |
| Ohio..... | 39.1 | 26.0 | 48.0 | 41.0 | 32.5 | 37.5 | 36.5 | 74 | 104 | 57 | 60 | 77 | 76 | 78 |
| Indiana..... | 36.1 | 25.6 | 43.5 | 38.0 | 31.5 | 35.2 | 32.0 | 66 | 94 | 55 | 50 | 68 | 69 | 71 |
| Illinois..... | 35.3 | 33.0 | 42.0 | 35.0 | 30.0 | 38.4 | 35.0 | 69 | 95 | 58 | 56 | 71 | 70 | 72 |
| Michigan..... | 34.5 | 28.5 | 40.0 | 34.0 | 27.5 | 33.5 | 21.5 | 83 | 106 | 75 | 73 | 85 | 84 | 80 |
| Wisconsin..... | 39.6 | 26.0 | 46.5 | 34.5 | 32.5 | 42.0 | 40.0 | 83 | 105 | 72 | 75 | 84 | 78 | 83 |
| Minnesota..... | 35.5 | 27.0 | 36.0 | 34.0 | 30.5 | 34.0 | 35.0 | 64 | 85 | 56 | 56 | 64 | 62 | 65 |
| Iowa..... | 39.8 | 28.0 | 43.9 | 39.0 | 35.5 | 41.5 | 40.0 | 67 | 93 | 56 | 56 | 69 | 67 | 70 |
| Missouri..... | 27.7 | 24.0 | 29.5 | 27.2 | 29.0 | 29.0 | 23.5 | 76 | 96 | 69 | 68 | 75 | 73 | 66 |
| North Dakota..... | 25.3 | 21.5 | 23.5 | 18.0 | 25.0 | 21.5 | 15.5 | 63 | 76 | 55 | 68 | 62 | 61 | 81 |
| South Dakota..... | 27.3 | 21.3 | 17.5 | 18.0 | 29.0 | 21.0 | 22.8 | 61 | 80 | 60 | 58 | 57 | 62 | 62 |
| Nebraska..... | 26.0 | 22.0 | 26.0 | 15.5 | 33.1 | 23.8 | 26.0 | 67 | 91 | 61 | 68 | 62 | 71 | 60 |
| Kansas..... | 19.1 | 21.7 | 16.6 | 11.0 | 30.0 | 27.0 | 17.5 | 70 | 87 | 66 | 70 | 61 | 65 | 74 |
| North Central..... | 32.3 | 25.8 | 34.4 | 29.0 | 31.5 | 32.8 | 30.3 | 68.8 | 92.7 | 59.9 | 59.7 | 68.0 | 69.3 | 72.4 |
| Delaware..... | 32.8 | 27.0 | 37.0 | 31.0 | 35.0 | 33.0 | 32.0 | 80 | 112 | 65 | 64 | 80 | 84 | 88 |
| Maryland..... | 39.3 | 31.0 | 45.0 | 39.8 | 44.0 | 36.5 | 36.5 | 81 | 111 | 70 | 64 | 80 | 84 | 88 |
| Virginia..... | 26.8 | 21.0 | 22.0 | 27.5 | 29.5 | 27.5 | 29.0 | 100 | 126 | 101 | 85 | 92 | 100 | 100 |
| West Virginia..... | 33.0 | 26.0 | 36.5 | 33.0 | 33.5 | 36.0 | 31.5 | 103 | 121 | 100 | 94 | 100 | 103 | 106 |
| North Carolina..... | 20.6 | 18.0 | 18.5 | 22.0 | 22.8 | 18.5 | 21.5 | 103 | 124 | 110 | 88 | 91 | 103 | 100 |
| South Carolina..... | 15.6 | 12.0 | 12.3 | 15.5 | 17.0 | 12.0 | 16.4 | 104 | 123 | 110 | 90 | 90 | 106 | 90 |
| Georgia..... | 13.4 | 11.5 | 10.7 | 14.5 | 14.0 | 10.5 | 13.8 | 95 | 112 | 100 | 76 | 81 | 105 | 88 |
| Florida..... | 14.0 | 13.5 | 15.0 | 14.0 | 13.0 | 13.0 | 13.5 | 100 | 112 | 100 | 92 | 97 | 100 | 85 |
| South Atlantic..... | 19.6 | 16.0 | 17.6 | 20.5 | 21.0 | 17.8 | 20.1 | 97.5 | 119.2 | 98.8 | 82.4 | 88.2 | 101.0 | 95.5 |
| Kentucky..... | 27.3 | 25.0 | 26.5 | 33.0 | 26.0 | 22.0 | 27.5 | 84 | 102 | 81 | 65 | 88 | 90 | 91 |
| Tennessee..... | 24.0 | 21.5 | 20.0 | 27.5 | 24.0 | 19.5 | 25.0 | 88 | 108 | 89 | 66 | 83 | 100 | 92 |
| Alabama..... | 11.6 | 12.5 | 13.5 | 16.2 | 16.0 | 11.5 | 14.0 | 100 | 122 | 100 | 70 | 92 | 110 | 98 |
| Mississippi..... | 16.5 | 12.0 | 18.0 | 19.2 | 17.8 | 14.0 | 20.0 | 109 | 126 | 94 | 82 | 93 | 102 | 93 |
| Arkansas..... | 18.1 | 16.0 | 14.0 | 20.5 | 19.0 | 17.0 | 14.0 | 94 | 107 | 97 | 80 | 87 | 91 | 98 |
| Louisiana..... | 16.9 | 11.5 | 18.0 | 17.5 | 17.5 | 17.0 | 18.2 | 99 | 115 | 94 | 90 | 90 | 94 | 90 |
| Oklahoma..... | 19.3 | 19.0 | 7.5 | 26.0 | 26.5 | 23.0 | 16.0 | 76 | 89 | 90 | 56 | 59 | 68 | 70 |
| Texas..... | 20.5 | 16.0 | 8.5 | 27.8 | 23.0 | 21.0 | 19.0 | 89 | 110 | 110 | 60 | 65 | 78 | 85 |
| South Central..... | 20.1 | 17.3 | 15.9 | 24.6 | 22.0 | 18.9 | 19.6 | 88.0 | 107.2 | 91.5 | 67.5 | 77.3 | 88.2 | 89.7 |
| Montana..... | 17.6 | 18.0 | 16.5 | 11.0 | 23.5 | 19.0 | 12.0 | 85 | 99 | 95 | 92 | 72 | 82 | 84 |
| Idaho..... | 37.7 | 30.7 | 41.0 | 41.0 | 41.0 | 46.0 | 36.0 | 87 | 113 | 75 | 90 | 82 | 92 | 94 |
| Wyoming..... | 21.3 | 12.0 | 23.0 | 20.0 | 20.0 | 16.0 | 16.0 | 76 | 94 | 70 | 72 | 74 | 75 | 85 |
| Colorado..... | 15.6 | 10.0 | 15.0 | 7.0 | 15.5 | 13.0 | 17.0 | 72 | 88 | 70 | 71 | 68 | 68 | 75 |
| New Mexico..... | 19.1 | 18.0 | 18.0 | 20.0 | 15.0 | 17.5 | 20.0 | 97 | 110 | 100 | 87 | 93 | 89 | 89 |
| Arizona..... | 27.6 | 22.0 | 26.0 | 28.0 | 32.0 | 26.0 | 28.0 | 122 | 125 | 130 | 120 | 115 | 125 | 130 |
| Utah..... | 23.0 | 20.0 | 24.0 | 24.0 | 27.0 | 29.0 | 31.0 | 113 | 145 | 100 | 115 | 110 | 110 | 100 |
| Nevada..... | 21.1 | 22.4 | 25.0 | 24.0 | 25.0 | 22.0 | 28.0 | 120 | 121 | 120 | 120 | 115 | 112 | 120 |
| Washington..... | 36.5 | 30.0 | 35.0 | 35.0 | 37.0 | 39.0 | 38.0 | 97 | 112 | 95 | 95 | 90 | 90 | 100 |
| Oregon..... | 31.5 | 30.5 | 29.0 | 33.0 | 36.0 | 36.0 | 35.0 | 103 | 121 | 107 | 100 | 95 | 100 | 108 |
| California..... | 33.8 | 33.5 | 35.1 | 31.5 | 32.0 | 32.0 | 31.0 | 116 | 138 | 118 | 106 | 108 | 105 | 112 |
| Far Western..... | 19.5 | 14.4 | 18.0 | 13.1 | 19.9 | 17.2 | 18.9 | 84.4 | 101.6 | 83.1 | 85.8 | 78.1 | 81.2 | 85.0 |
| United States..... | 27.8 | 22.9 | 28.8 | 27.0 | 28.1 | 28.0 | 26.8 | 74.9 | 98.2 | 67.4 | 64.2 | 72.3 | 75.2 | 78.1 |

TABLE 48.—*Corn: Acreage, yield per acre, and production in specified countries, average 1909-1913, 1921-1925, annual, 1927-1929*

| Country | Acreage | | | | Yield per acre | | | | Production | | | |
|--|--------------------------------|--------------------------------|----------------|--------------------------------|--------------------------------|--------------------------------|---------|--------------------------------|---------------------------|---------------------------|------------------|--------------------------------|
| | Aver- age, 1909- 1913 | Aver- age, 1921- 1925 | 1927 | 1929, pre- limi- nary | Aver- age, 1909- 1913 | Aver- age, 1921- 1925 | 1927 | 1929, pre- limi- nary | Average, 1909- 1913 | Average, 1921- 1925 | 1927 | 1929, pre- limi- nary |
| NORTHERN HEMISPHERE | | | | | | | | | | | | |
| NORTH AMERICA | | | | | | | | | | | | |
| Canada..... | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | Bushels | Bushels | Bushels | Bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| United States..... | 309,293 | 293,132 | 332,139 | 352,152 | 56.0 | 44.3 | 32.3 | 34.1 | 17,257 | 12,974 | 4,262 | 5,183 |
| Mexico..... | 104,229 | 102,826 | 98,383 | 100,673 | 26.0 | 27.8 | 28.1 | 26.8 | 2,712,354 | 2,550,004 | 2,763,063 | 2,612,189 |
| Guatemala..... | 5,033 (500) | 5,575 | 7,965 | 7,690 | 13.5 | 11.3 | 10.2 | 11.1 | 123,362 | 85,241 | 81,839 | 60,777 |
| | | 390 | 289 | 343 | | 11.8 | 15.0 | 14.1 | 6,245 | 4,614 | 4,322 | 5,059 |
| Total North American countries reporting area and production, all years..... | 105,038 | 103,509 | 98,814 | 101,110 | 26.0 | 27.7 | 28.0 | 26.7 | 2,735,906 | 2,888,492 | 2,771,677 | 2,828,431 |
| Estimated North American total..... | 111,700 | 111,900 | 107,600 | 109,500 | | | | | 2,877,000 | 2,965,000 | 2,865,000 | 2,705,000 |
| EUROPE | | | | | | | | | | | | |
| France..... | 1,160 | 830 | 861 | 849 | 19.4 | 17.8 | 24.1 | 23.1 | 22,467 | 14,754 | 20,721 | 19,646 |
| Spain..... | 1,134 | 1,167 | 1,143 | 960 | 23.4 | 22.2 | 22.3 | 21.5 | 26,548 | 25,933 | 26,104 | 25,190 |
| Italy..... | 4,090 | 3,802 | 3,540 | 3,711 | 25.1 | 24.9 | 24.7 | 26.5 | 102,676 | 94,800 | 87,377 | 64,990 |
| Austria..... | 140 | 147 | 147 | 143 | 23.8 | 26.7 | 33.7 | 29.6 | 4,530 | 3,739 | 4,948 | 4,169 |
| Czechoslovakia..... | 376 | 380 | 344 | 356 | 22.3 | 26.8 | 29.7 | 24.6 | 8,398 | 10,444 | 10,223 | 8,797 |
| Hungary..... | 2,162 | 2,437 | 2,625 | 2,623 | 27.7 | 23.9 | 26.0 | 28.2 | 60,813 | 58,353 | 68,347 | 76,609 |
| Yugoslavia..... | 4,786 | 4,759 | 5,106 | 5,018 | 23.4 | 23.0 | 16.3 | 14.3 | 111,897 | 109,399 | 83,007 | 160,742 |
| Bulgaria..... | 1,462 | 1,438 | 1,682 | 1,585 | 17.6 | 14.4 | 12.5 | 12.7 | 26,277 | 21,021 | 20,954 | 40,383 |
| Rumania..... | 9,644 | 8,799 | 10,426 | 11,010 | 20.0 | 16.0 | 13.3 | 9.9 | 193,205 | 140,515 | 139,092 | 240,148 |
| Poland..... | 164 | 197 | 217 | 224 | 17.2 | 14.9 | 16.2 | 14.9 | 2,822 | 2,926 | 3,319 | 3,348 |
| Russia, European and Asiatic..... | 3,246 | 5,206 | 6,611 | 10,928 | 16.1 | 17.4 | 20.2 | 12.2 | 52,185 | 90,626 | 133,786 | 133,022 |
| Total European countries re- porting area and production, all years..... | 25,064 | 23,782 | 25,874 | 26,265 | 22.2 | 20.1 | 17.8 | 23.6 | 556,815 | 478,958 | 480,783 | 676,028 |
| Estimated European total, ex- cluding Russia..... | 26,400 | 25,200 | 27,300 | 27,800 | | | | | 581,000 | 500,000 | 485,000 | 667,000 |
| AFRICA | | | | | | | | | | | | |
| Morocco..... | (438) | 437 | 527 | 599 | | 8.3 | 9.1 | 7.7 | (3,500) | 3,629 | 4,788 | 6,864 |
| Egypt..... | 1,705 | 1,988 | 2,214 | 2,131 | | 34.8 | 37.0 | | 64,273 | 69,036 | 81,914 | |
| Estimated African total..... | 2,600 | 3,100 | 3,800 | 3,300 | | | | | 75,000 | 84,000 | 104,000 | 104,000 |

ASIA

| | | | | | | | | | | | | |
|--|---------|---------|---------|---------|---------|------|------|-----------|-----------|-----------|-----------|-----------|
| ASIA | | | | | | | | | | | | |
| India..... | 6,372 | 5,937 | 5,555 | 5,943 | 13.9 | 13.8 | 15.2 | 3,52,620 | 82,482 | 76,760 | 90,160 | |
| Japan..... | 153 | 141 | 126 | | 25.3 | 26.3 | | 3,391 | 3,655 | 3,314 | | |
| China..... | 156 | 231 | 251 | 253 | 14.3 | 11.4 | 12.5 | 2,236 | 2,819 | 2,554 | 3,190 | |
| Kwantung..... | 99 | 102 | 191 | 203 | 17.1 | 18.3 | 21.4 | 1,737 | 2,771 | 3,407 | 4,353 | |
| Philippines..... | 4,812 | 1,338 | 1,387 | 1,284 | 9.2 | 13.8 | 13.1 | 47,461 | 16,755 | 19,145 | 16,765 | |
| Estimated Asiatic total..... | 9,800 | 10,500 | 10,000 | 10,200 | 10,400 | | | 160,000 | 187,000 | 225,000 | 213,000 | |
| Total Northern Hemisphere countries reporting area and production, all years..... | | | | | | | | | | | | |
| Estimated Northern Hemisphere total, excluding Russia..... | 130,540 | 127,728 | 125,215 | 127,974 | 127,749 | 25.3 | 25.9 | 25.0 | 3,296,221 | 3,351,079 | 3,237,248 | 3,312,900 |
| SOUTHERN HEMISPHERE | | | | | | | | | | | | |
| Brazil..... | (6,000) | 6,980 | 5,447 | | 25.4 | 23.9 | | (140,000) | 177,338 | 130,178 | | |
| Chile..... | 56 | 63 | 62 | | 23.3 | 28.3 | | 1,455 | 1,466 | 1,817 | | |
| Uruguay..... | 589 | 470 | 572 | 525 | 10.4 | 15.5 | 3.6 | 6,120 | 4,919 | 8,833 | 2,966 | |
| Argentina..... | 8,710 | 8,688 | 10,739 | 11,331 | 22.0 | 28.5 | 13.6 | 191,698 | 227,383 | 303,691 | 231,702 | |
| Union of South Africa..... | (2,300) | 4,456 | 4,736 | 5,316 | 12.8 | 14.5 | 12.0 | 433,517 | 56,860 | 68,323 | 63,946 | |
| Southern Rhodesia..... | 161 | 223 | 295 | 338 | 11.4 | 15.7 | 19.0 | 1,834 | 4,140 | 4,630 | 6,429 | |
| Java and Madura..... | (3,000) | 3,982 | 4,779 | 4,603 | 15.2 | 16.5 | 16.6 | (42,000) | 60,616 | 78,618 | 76,456 | |
| Australia..... | 353 | 326 | 401 | | 28.5 | 28.4 | | 10,057 | 8,641 | 11,394 | | |
| Total Southern Hemisphere countries reporting area and production all years through 1923..... | | | | | | | | | | | | |
| Estimated Southern Hemisphere total..... | 14,760 | 17,819 | 21,121 | 22,813 | 18.6 | 19.9 | 16.8 | 27.5,169 | 353,958 | 466,315 | 383,539 | |
| Total Northern and Southern Hemisphere countries reporting area and production all years through 1923..... | | | | | | | | | | | | |
| Estimated world total, excluding Russia..... | 158,996 | 160,987 | 161,922 | 166,386 | 23.9 | 24.2 | 22.7 | 3,301,628 | 3,898,031 | 3,891,177 | 3,783,576 | |
| Estimated world total, excluding Russia..... | 172,400 | 177,300 | 178,400 | 184,600 | | | | 4,138,000 | 4,308,000 | 4,339,000 | 4,213,000 | |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Figures refer to the crop harvested in the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

1 Where changes in boundary have occurred, the averages reported are estimates for the crop within present boundaries.

2 1 year only.

3 2-year average.

4 4-year average.

5 The estimate for the 5-year period, 1909-1913, given in this table is somewhat larger than the figure obtained by averaging the same 5-year period in Table 49. This is because in this table estimates for warring countries are for postwar boundaries, whereas in Table 49 they are for pre-war territory. As a result in excluding Russia, which lost territory in the war, a smaller area is included in this table than in Table 49.

6 Includes some sorghum.

TABLE 49.—*Corn: World production, 1900-1929*

| Year | Estimated world production, excluding Russia | Estimated European production, excluding Russia | Selected countries | | | | | | |
|-------------------|--|---|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|
| | | | United States | Italy | Rumania | Argentina | Brazil | Yugoslavia | Russia ¹ |
| | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels |
| 1900 | 3,582 | 410 | 2,505 | 88 | 85 | 99 | | 18 | 34 |
| 1901 | 2,745 | 497 | 1,614 | 100 | 117 | 84 | | 19 | 68 |
| 1902 | 3,683 | 392 | 2,616 | 71 | 68 | 149 | | 18 | 49 |
| 1903 | 3,551 | 459 | 2,347 | 89 | 80 | 175 | | 19 | 51 |
| 1904 | 3,502 | 279 | 2,520 | 91 | 20 | 141 | | 9 | 26 |
| 1905 | 3,902 | 404 | 2,749 | 97 | 59 | 195 | | 21 | 34 |
| 1906 | 4,088 | 533 | 2,898 | 93 | 131 | 72 | | 28 | 92 |
| 1907 | 3,769 | 441 | 2,512 | 88 | 58 | 136 | | 18 | 64 |
| 1908 | 3,830 | 465 | 2,545 | 96 | 79 | 177 | | 21 | 82 |
| 1909 | 3,858 | 499 | 2,572 | 99 | 70 | 175 | | 34 | 55 |
| 1910 | 4,060 | 564 | 2,886 | 102 | 104 | 28 | | 29 | 102 |
| 1911 | 3,908 | 501 | 2,531 | 91 | 111 | 296 | | 27 | 95 |
| 1912 | 4,451 | 547 | 3,125 | 99 | 104 | 197 | | | 91 |
| 1913 | 3,890 | 576 | 2,447 | 108 | 115 | 263 | | | 84 |
| 1914 | 4,186 | 559 | 2,673 | 105 | 103 | 325 | | | 90 |
| 1915 | 4,352 | 520 | 2,995 | 122 | 86 | 161 | | | 72 |
| 1916 | 3,770 | 389 | 2,567 | 82 | 59 | 204 | | | 62 |
| 1917 | 4,178 | 351 | 3,065 | 83 | 171 | 95 | | | |
| 1918 | 3,579 | 290 | 2,503 | 77 | 31 | 224 | 87 | | |
| 1919 | 4,242 | 454 | 2,811 | 86 | 141 | 259 | 197 | | |
| 1920 | 4,689 | 520 | 3,269 | 89 | 182 | 230 | 186 | | |
| 1921 | 4,315 | 394 | 3,069 | 92 | 111 | 176 | 181 | 101 | 46 |
| 1922 | 4,240 | 424 | 2,906 | 77 | 120 | 176 | 202 | 90 | 81 |
| 1923 | 4,520 | 469 | 3,054 | 89 | 153 | 277 | 180 | 85 | 67 |
| 1924 | 3,858 | 589 | 2,509 | 106 | 155 | 186 | 162 | 149 | 91 |
| 1925 | 4,568 | 626 | 2,917 | 110 | 164 | 322 | 162 | 149 | 168 |
| 1926 | 4,476 | 654 | 2,692 | 118 | 230 | 321 | 139 | 134 | 129 |
| 1927 | 4,339 | 485 | 2,763 | 87 | 139 | 306 | 130 | 83 | 134 |
| 1928 | 4,213 | 381 | 2,819 | 65 | 109 | 232 | | 72 | 133 |
| 1929 ⁶ | | 697 | 2,622 | 99 | 240 | | | 161 | |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

¹ Includes all Russian territory reporting for the years shown.

² Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.

³ Exclusive of Russian Poland, Lithuania, parts of present Latvia and the Ukraine, and the Provinces of Batum and Elizabetpol in Transcaucasia.

⁴ Beginning this year estimates within present boundaries of the Union of Socialist Soviet Republics, exclusive of Turkestan, Transcaucasia, and the Far East, which territory in 1921 produced 26,048,000 bushels.

⁵ Production in present boundaries beginning this year, therefore not comparable with earlier years.

⁶ Preliminary.

TABLE 50.—*Corn: Monthly marketings, by farmers, as reported by about 3,500 mills and elevators, United States, 1917-1928*

| Year beginning July | Percentage of year's receipts | | | | | | | | | | | | Season |
|---------------------|-------------------------------|------|-------|------|------|------|------|------|------|------|-----|------|--------|
| | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | |
| 1917 | 5.3 | 4.0 | 3.4 | 3.8 | 8.8 | 12.2 | 14.2 | 16.1 | 13.7 | 7.1 | 5.6 | 5.8 | 100.0 |
| 1918 | 6.7 | 6.9 | 8.4 | 6.7 | 7.3 | 12.0 | 15.0 | 7.2 | 7.5 | 8.2 | 8.0 | 6.1 | 100.0 |
| 1919 | 4.5 | 5.6 | 4.9 | 5.6 | 9.2 | 15.0 | 12.9 | 9.5 | 8.7 | 5.9 | 7.6 | 10.6 | 100.0 |
| 1920 | 5.4 | 5.6 | 6.9 | 5.3 | 7.1 | 11.3 | 14.3 | 11.7 | 8.9 | 6.6 | 8.5 | 9.4 | 100.0 |
| 1921 | 4.9 | 7.3 | 8.6 | 6.7 | 6.6 | 12.4 | 13.8 | 12.4 | 7.5 | 4.7 | 7.6 | 7.5 | 100.0 |
| 1922 | 6.8 | 7.5 | 9.1 | 8.2 | 8.7 | 13.6 | 10.7 | 11.0 | 6.6 | 5.3 | 6.1 | 6.4 | 100.0 |
| 1923 | 6.8 | 7.2 | 6.1 | 5.6 | 10.4 | 12.3 | 12.9 | 13.3 | 7.4 | 6.1 | 5.9 | 6.0 | 100.0 |
| 1924 | 6.6 | 6.2 | 6.5 | 7.0 | 11.1 | 13.0 | 13.6 | 9.5 | 8.1 | 6.3 | 7.8 | 4.3 | 100.0 |
| 1925 | 5.1 | 7.6 | 5.9 | 5.9 | 9.3 | 14.6 | 12.1 | 10.4 | 8.5 | 6.3 | 7.1 | 8.2 | 100.0 |
| 1926 | 5.7 | 6.2 | 6.6 | 10.1 | 9.1 | 12.9 | 11.7 | 10.8 | 6.9 | 4.8 | 6.1 | 9.1 | 100.0 |
| 1927 | 5.1 | 6.5 | 6.3 | 6.2 | 8.6 | 15.5 | 13.8 | 11.7 | 8.9 | 5.4 | 6.6 | 5.4 | 100.0 |
| 1928 | 5.8 | 5.8 | 5.4 | 6.6 | 12.5 | 16.7 | 12.9 | 11.5 | 7.4 | 3.8 | 4.3 | 7.3 | 100.0 |

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TABLE 51.—Corn: Farm stocks, growing conditions, and shipments, United States, 1909–1929

| Year beginning November | Stocks of old corn on farms Nov. 1 ¹ | Condition of new crop | | | | Proportion merchantable ¹ | Stocks of corn on farms on Mar. 1 following ¹ | Shipped out of county where grown ¹ |
|-------------------------|---|-----------------------|--------|---------|--------|--------------------------------------|--|--|
| | | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | | | |
| | 1,000 bush. | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | 1,000 bush. | 1,000 bush. |
| 1909 | 77,403 | 89.3 | 84.4 | 74.6 | 73.8 | 82.7 | 980,848 | 620,057 |
| 1910 | 113,919 | 85.4 | 79.3 | 78.2 | 80.3 | 86.4 | 1,165,378 | 661,777 |
| 1911 | 123,824 | 80.1 | 69.6 | 70.3 | 70.4 | 80.1 | 884,059 | 517,766 |
| 1912 | 64,764 | 81.5 | 80.0 | 82.1 | 82.2 | 85.0 | 1,200,642 | 680,831 |
| 1913 | 137,972 | 86.9 | 75.8 | 65.1 | 65.3 | 80.1 | 866,352 | 422,059 |
| 1914 | 80,046 | 85.8 | 74.8 | 71.7 | 72.9 | 84.5 | 910,894 | 498,285 |
| 1915 | 96,009 | 81.2 | 79.5 | 78.8 | 79.7 | 71.1 | 1,116,559 | 560,824 |
| 1916 | 87,908 | 82.0 | 75.3 | 71.3 | 71.5 | 83.9 | 782,303 | 450,589 |
| 1917 | 34,448 | 81.1 | 78.8 | 76.7 | 75.9 | 60.0 | 1,253,290 | 678,027 |
| 1918 | 114,678 | 87.1 | 78.5 | 67.4 | 68.6 | 82.4 | 855,269 | 262,589 |
| 1919 | 69,835 | 86.7 | 81.7 | 80.0 | 81.3 | 87.1 | 1,045,575 | 470,328 |
| 1920 | 130,083 | 84.6 | 86.7 | 86.4 | 89.1 | 86.9 | 1,564,832 | 705,481 |
| 1921 | 285,769 | 91.1 | 84.3 | 85.1 | 84.8 | 87.5 | 1,305,559 | 587,803 |
| 1922 | 177,287 | 85.1 | 85.6 | 78.6 | 78.4 | 88.3 | 1,093,306 | 513,779 |
| 1923 | 83,856 | 84.9 | 84.0 | 83.3 | 82.0 | 80.8 | 1,153,847 | 600,745 |
| 1924 | 102,429 | 72.0 | 70.7 | 66.4 | 65.3 | 66.0 | 757,890 | 417,780 |
| 1925 | 58,248 | 86.4 | 79.8 | 75.5 | 76.2 | 78.8 | 1,329,281 | 578,880 |
| 1926 | 182,994 | 77.9 | 72.5 | 73.8 | 72.4 | 71.1 | 1,134,191 | 440,051 |
| 1927 | 113,399 | 69.9 | 71.2 | 69.7 | 73.6 | 73.1 | 1,011,908 | 501,748 |
| 1928 | 53,753 | 78.1 | 83.3 | 78.4 | 77.7 | 80.2 | 1,021,873 | 538,840 |
| 1929 ² | 76,389 | 77.6 | 78.8 | 67.9 | 71.0 | | | |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Based on reported percentages of entire crop on farms, proportion merchantable, and per cent shipped out of county where grown.

² Preliminary.

TABLE 52.—Corn: Receipts at primary markets, 1921–1928

| Year beginning November | Chicago | St. Louis | Kansas City | Peoria | Omaha | Indianapolis | Total 10 markets ¹ |
|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1921 | 187,884 | 34,055 | 16,031 | 24,960 | 31,115 | 21,291 | 375,409 |
| 1922 | 116,711 | 30,263 | 15,595 | 21,284 | 23,308 | 18,839 | 253,590 |
| 1923 | 101,200 | 39,299 | 21,105 | 17,744 | 27,679 | 17,728 | 271,128 |
| 1924 | 80,709 | 23,185 | 21,470 | 21,224 | 13,345 | 17,613 | 202,504 |
| 1925 | 93,283 | 27,952 | 18,643 | 26,678 | 20,076 | 18,363 | 226,192 |
| 1926 | 91,880 | 21,039 | 14,767 | 23,292 | 20,492 | 19,977 | 217,881 |
| 1927 | 105,134 | 34,943 | 47,063 | 23,434 | 31,019 | 22,712 | 280,492 |
| 1928 (preliminary) | 95,069 | 38,517 | 33,634 | 27,390 | 16,276 | 25,519 | 267,707 |

Bureau of Agricultural Economics. Compiled from reports of Chicago Board of Trade, Duluth Board of Trade, Indianapolis Board of Trade, Kansas City Board of Trade, Omaha Grain Exchange, St. Louis Merchants Exchange, Milwaukee Chamber of Commerce, Minneapolis Chamber of Commerce, and American Elevator and Grain Trade.

Includes also Milwaukee, Minneapolis, Duluth, and Toledo.

TABLE 53.—Shelled corn: Classification of receipts graded by licensed inspectors, all inspection points, 1917–1928

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE

| Year and class | Receipts of— | | | | | | Sample grade | Total |
|----------------------|--------------|---------|---------|--------|--------|--------|--------------|---------|
| | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | | |
| Year beginning Nov.— | Cars | Cars | Cars | Cars | Cars | Cars | Cars | Cars |
| 1917 | 2,281 | 18,711 | 58,562 | 56,240 | 45,610 | 44,621 | 98,844 | 324,872 |
| 1918 | 12,661 | 34,727 | 40,872 | 41,491 | 28,832 | 16,061 | 19,638 | 194,262 |
| 1919 | 25,517 | 47,961 | 38,774 | 56,647 | 27,313 | 9,188 | 13,058 | 221,458 |
| 1920 | 68,550 | 88,875 | 64,237 | 63,081 | 21,176 | 9,420 | 8,738 | 324,077 |
| 1921 | 30,970 | 197,254 | 115,207 | 42,820 | 21,963 | 15,979 | 4,961 | 429,204 |
| 1922 | 21,580 | 141,563 | 98,932 | 24,262 | 4,270 | 3,526 | 3,711 | 297,844 |
| 1923 | 3,033 | 59,592 | 111,032 | 69,365 | 35,905 | 15,410 | 10,742 | 305,944 |
| 1924 | 7,883 | 80,883 | 56,542 | 34,431 | 31,370 | 17,252 | 12,345 | 210,706 |
| 1925 | 3,358 | 59,985 | 62,757 | 51,092 | 48,348 | 40,116 | 31,473 | 297,129 |
| 1926 | 1,616 | 34,390 | 57,921 | 48,217 | 50,195 | 46,180 | 31,171 | 269,709 |
| 1927 | 9,682 | 87,801 | 78,352 | 47,850 | 34,038 | 27,553 | 29,006 | 314,922 |
| 1928 | 25,809 | 92,285 | 73,331 | 93,367 | 40,594 | 10,400 | 7,247 | 343,033 |

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TABLE 54.—*Corn, including meal in terms of grain: International trade, average 1910-1914, annual 1926-1929*

| Country | Year ended June 30-- | | | | | | | | | |
|--------------------------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|------------------------|----------------------|
| | Average, 1910-1914 | | 1926 | | 1927 | | 1928 | | 1929, prelim- inary | |
| | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| Argentina..... | ¹ 2 | ¹ 115,749 | | 142,956 | | 272,454 | | 279,455 | | ² 23,181 |
| United States..... | ⁴ 4,441 | 41,409 | 635 | 24,783 | 1,098 | 19,819 | 5,463 | 19,410 | 490 | 41,860 |
| Rumania..... | ¹ 364 | ¹ 46,998 | 21 | 21,239 | 0 | 59,037 | 0 | | | |
| Yugoslavia..... | 0 | 0 | | ⁵ 41,122 | | 14,496 | | 671 | | 534 |
| Union of South Africa..... | ¹ 143 | ¹ 3,952 | | 38,332 | | 1,430 | | 17,620 | | |
| Russia..... | ⁶ 299 | ⁶ 28,354 | 0 | 7,867 | 0 | 8,170 | 0 | 2,366 | | |
| Bulgaria..... | ¹ 44 | ⁶ 0,234 | 0 | 3,799 | 0 | 5,365 | 0 | | | |
| Hungary..... | 0 | 0 | 46 | 8,752 | 330 | 2,524 | 688 | 2,028 | ¹ 1,124 | 802 |
| Dutch East Indies ⁴ | 0 | ¹¹ 215 | 7 | 3,310 | 10 | 2,684 | 13 | 3,054 | ⁷ 10 | ⁷ 6,434 |
| Indo-China..... | 0 | 0 | 0 | 2,335 | 0 | 2,691 | 0 | 2,979 | | |
| British India..... | 0 | ¹ 580 | 0 | 38 | 0 | 2 | 0 | 1,058 | 0 | 29 |
| China ² | ⁶ 38 | ⁶ 148 | 0 | 758 | 0 | 93 | 0 | 490 | | |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 80,441 | ¹ 115 | 70,914 | 2,593 | 71,196 | 2,794 | 75,705 | 2,552 | 72,332 | 2,308 |
| Netherlands..... | ⁶ 30,377 | ⁶ 8,641 | 38,965 | 443 | 47,149 | 736 | 53,234 | 729 | 41,471 | 717 |
| Germany..... | 32,056 | 2 | 19,679 | 103 | 57,910 | 4 | 72,050 | 4 | 32,915 | 5 |
| France..... | 19,793 | 88 | 21,326 | 108 | 29,123 | 94 | 25,594 | 32 | 30,764 | 21 |
| Belgium..... | 25,818 | 8,238 | 22,588 | 655 | 28,873 | 1,501 | 27,317 | 1,121 | 22,610 | 1,096 |
| Denmark..... | ⁶ 11,777 | 0 | 16,198 | 0 | 22,727 | 0 | 20,727 | 0 | 14,794 | 0 |
| Irish Free State..... | 0 | 0 | 14,127 | 92 | 15,679 | 172 | 16,847 | 152 | 17,536 | 142 |
| Spain..... | 2,023 | 49 | 18,547 | 1 | 11,540 | 1 | | | | |
| Italy..... | 14,829 | 265 | 14,232 | 119 | 16,134 | 23 | 21,135 | 24 | | |
| Canada..... | 10,678 | 27 | 9,325 | 62 | 14,924 | 56 | 15,151 | 41 | | |
| Czechoslovakia..... | 0 | 0 | 13,824 | 12 | 13,073 | 2 | 13,930 | 7 | 10,579 | 1 |
| Austria..... | ⁶ 15,455 | ⁶ 10 263 | 6,387 | 19 | 7,946 | 18 | 6,136 | 13 | | |
| Switzerland..... | ⁶ 3,984 | ⁶ 1 | 5,539 | 0 | 4,832 | 0 | 5,459 | 0 | 5,370 | 0 |
| Norway..... | ⁶ 11 1,292 | ⁶ 26 | 4,497 | 0 | 5,048 | 0 | 5,176 | 0 | 3,642 | 0 |
| Sweden..... | ⁶ 1,656 | 0 | 3,771 | 0 | 4,652 | 0 | 7,752 | 0 | 5,533 | 0 |
| Cuba..... | 2,860 | 0 | 3,103 | 0 | 2,935 | 0 | 2,068 | 0 | | |
| Australia..... | ¹ 440 | ¹ 10 | 1,573 | 34 | 1,193 | 2 | | | | |
| Mexico ² | 4,459 | 101 | 2,615 | 8 | 4,303 | 2 | 1,119 | | 393 | |
| Poland..... | 0 | 0 | 1,792 | 65 | 4,235 | 21 | 3,018 | 8 | 1,144 | 15 |
| Greece..... | 0 | 0 | 628 | | 1,270 | | 1,005 | | 1,145 | |
| Egypt..... | ⁶ 504 | ⁶ 63 | 914 | 0 | 294 | 235 | 30 | 5,855 | 31 | 2,761 |
| Japan..... | 0 | 0 | ⁵ 558 | ⁵ 0 | 1,515 | 0 | 1,172 | 0 | 1,587 | 0 |
| Tunis..... | ⁶ 442 | ⁶ 8 | 291 | 23 | 684 | 35 | 1,145 | | | |
| Algeria..... | ¹ 231 | ¹ 1 | 65 | 10 | 600 | 12 | 240 | 25 | | |
| Finland..... | ¹ 260 | 0 | 44 | 0 | 148 | 0 | 206 | 0 | 293 | 0 |
| Uruguay ² | 5 | 201 | 132 | 43 | 878 | 4 | 615 | 2 | | 2,364 |
| Latvia ⁵ | 0 | 0 | 20 | 0 | 8 | 0 | | | | |
| Estonia..... | 0 | 0 | ⁵ 16 | ⁵ 0 | 0 | 0 | 25 | 0 | 292 | 0 |
| Total 40 countries..... | 264,711 | 265,738 | 292,406 | 299,681 | 368,307 | 395,367 | 392,018 | 330,696 | 264,055 | 302,270 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. Maize or Maize is included with "Corn and corn meal."

¹ Average of years ended Dec. 31. International Yearbook of Agricultural Statistics.

² Year ended Dec. 31.

³ Trade sources.

⁴ 3-year average.

⁵ International Crop Report and Agricultural Statistics.

⁶ Average of years ended July 31, from International Institute of Agricultural Statistics.

⁷ Java and Madura only.

⁸ 2-year average.

⁹ 4-year average.

¹⁰ Average for Austria-Hungary.

¹¹ 1 year only.

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TABLE 55.—*Corn: Visible supply in United States,¹ 1909-1929*

| Year beginning November | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| 1909----- | 2,653 | 3,289 | 8,465 | 9,764 | 13,480 | 13,778 | 10,603 | 6,940 | 5,146 | 3,770 | 2,750 | 5,011 |
| 1910----- | 3,510 | 1,545 | 5,099 | 9,145 | 11,794 | 11,160 | 7,047 | 4,685 | 7,482 | 7,100 | 6,724 | 6,339 |
| 1911----- | 1,703 | 2,054 | 5,140 | 6,900 | 14,257 | 15,914 | 7,490 | 5,699 | 8,204 | 2,451 | 1,823 | 3,101 |
| 1912----- | 2,689 | 1,525 | 5,879 | 9,717 | 17,918 | 21,494 | 7,270 | 2,549 | 11,479 | 6,389 | 2,612 | 7,308 |
| 1913----- | 6,206 | 2,026 | 12,126 | 16,505 | 18,374 | 18,812 | 9,380 | 4,409 | 7,589 | 3,203 | 3,923 | 5,461 |
| 1914----- | 3,114 | 3,382 | 19,703 | 34,156 | 41,238 | 32,877 | 20,203 | 12,795 | 5,225 | 2,306 | 2,382 | 3,444 |
| 1915----- | 3,288 | 4,387 | 8,919 | 14,773 | 24,605 | 27,697 | 21,004 | 14,505 | 6,870 | 5,167 | 3,330 | 5,093 |
| 1916----- | 2,361 | 2,677 | 5,838 | 10,671 | 12,931 | 11,974 | 7,173 | 2,629 | 3,277 | 2,441 | 2,371 | 1,163 |
| 1917----- | 1,277 | 1,932 | 3,155 | 4,623 | 8,939 | 19,016 | 16,111 | 13,038 | 11,487 | 9,466 | 5,232 | 5,503 |
| 1918----- | 4,733 | 2,216 | 2,415 | 5,549 | 4,483 | 2,514 | 4,245 | 2,600 | 4,038 | 2,461 | 956 | 2,163 |
| 1919----- | 1,484 | 1,477 | 2,921 | 3,575 | 4,951 | 5,669 | 5,035 | 2,740 | 4,364 | 6,152 | 2,564 | 7,587 |
| 1920----- | 10,085 | 4,597 | 5,409 | 14,297 | 22,333 | 32,896 | 23,018 | 15,103 | 24,304 | 14,584 | 11,500 | 11,785 |
| 1921----- | 18,891 | 15,518 | 23,279 | 30,778 | 44,792 | 46,889 | 35,564 | 27,046 | 29,337 | 19,509 | 7,314 | 12,206 |
| 1922----- | 8,806 | 11,072 | 16,760 | 21,658 | 27,529 | 28,742 | 22,339 | 6,734 | 3,366 | 2,373 | 1,587 | 2,052 |
| 1923----- | 809 | 2,690 | 8,799 | 9,379 | 18,898 | 26,074 | 17,978 | 12,288 | 8,279 | 4,887 | 5,070 | 7,154 |
| 1924----- | 8,097 | 7,563 | 18,573 | 27,571 | 32,292 | 32,727 | 23,379 | 17,140 | 13,094 | 6,093 | 6,524 | 6,470 |
| 1925----- | 1,790 | 2,461 | 17,861 | 28,092 | 33,878 | 36,485 | 32,408 | 25,453 | 30,333 | 24,930 | 19,771 | 17,381 |
| 1926----- | 22,258 | 28,699 | 34,712 | 38,792 | 45,103 | 47,244 | 36,621 | 29,061 | 34,427 | 30,205 | 22,312 | 23,687 |
| 1927----- | 20,574 | 19,216 | 27,034 | 31,849 | 40,998 | 43,856 | 33,556 | 25,496 | 16,008 | 13,267 | 9,510 | 6,791 |
| 1928----- | 2,030 | 6,419 | 17,146 | 26,042 | 33,302 | 34,150 | 25,687 | 14,259 | 13,054 | 8,751 | 5,417 | 4,197 |
| 1929----- | 3,237 | 3,267 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from the Chicago Daily Trade Bulletin.

¹ Saturday nearest the 1st of each month.

TABLE 56.—*Corn: Commercial stocks in store, 1926-27 to 1929-30*

DOMESTIC CORN IN UNITED STATES¹

| | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. |
|--------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| 1926-27----- | ----- | ----- | 30,019 | 40,670 | 47,515 | 49,759 | 39,010 | 31,224 | 36,268 | 31,782 | 23,324 | 24,917 |
| 1927-28----- | 21,661 | 20,254 | 28,741 | 30,717 | 44,786 | 48,273 | 36,835 | 27,497 | 17,650 | 12,304 | 9,768 | 6,894 |
| 1928-29----- | 2,032 | 6,353 | 18,565 | 28,797 | 36,927 | 37,744 | 28,863 | 15,951 | 13,740 | 9,086 | 6,340 | 4,421 |
| 1929-30----- | 3,639 | 2,982 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

UNITED STATES CORN IN CANADA

| 1920-27----- | ----- | ----- | 2,147 | 1,715 | 1,788 | 1,403 | 1,781 | 1,452 | 1,184 | 1,706 | 1,188 | 2,016 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1927-28----- | 1,994 | 2,263 | 1,891 | 1,598 | 1,312 | 976 | 626 | 1,634 | 1,337 | 818 | 510 | 534 |
| 1928-29----- | 252 | 268 | 580 | 737 | 601 | 356 | 1,759 | 1,602 | 911 | 746 | 480 | 987 |
| 1929-30----- | 847 | 375 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from weekly reports to the Grain, Hay and Feed Market News Service. Data are for stocks on the Saturday nearest the 1st day of the month.

¹ Includes corn in store in public and private elevators in 39 important markets and also the corn afloat in vessels or barges in the harbors of lake and seaboard ports. Corn in transit either by rail or water, mill stocks, or small private stocks of corn intended only for local purposes, not included.

TABLE 57.—*Corn: Stocks of old corn on farms November 1, by selected States and by geographic divisions, 1909-1929*

[In millions of bushels]

| Year | Principal producing States | | | | | | (Geographic divisions) | | | | | | |
|------|----------------------------|----------|----------|----------|---------|------|------------------------|----------------|--------------------|--------------------|----------------|---------------|-------------|
| | Iowa | Illinois | Nebraska | Missouri | Indiana | Ohio | Total | North Atlantic | East North Central | West North Central | South Atlantic | South Central | Far Western |
| 1909 | 12.9 | 10.5 | 9.3 | 7.3 | 4.4 | 3.8 | 48.2 | 2.0 | 21.8 | 37.0 | 5.3 | 13.6 | .1 |
| 1910 | 20.5 | 21.9 | 14.1 | 6.9 | 10.0 | 8.0 | 82.3 | 2.4 | 41.1 | 53.6 | 4.7 | 10.6 | .3 |
| 1911 | 18.6 | 19.6 | 9.6 | 17.6 | 8.3 | 5.0 | 78.7 | 3.6 | 36.0 | 58.5 | 7.4 | 18.1 | .3 |
| 1912 | 8.9 | 30.4 | 2.5 | 4.6 | 4.0 | 4.2 | 35.5 | 3.5 | 22.3 | 21.5 | 6.5 | 10.8 | .1 |
| 1913 | 23.8 | 24.3 | 6.6 | 15.9 | 11.0 | 7.8 | 89.3 | 3.7 | 47.1 | 60.8 | 7.2 | 18.7 | .4 |
| 1914 | 14.2 | 9.0 | 2.9 | 5.2 | 6.3 | 5.4 | 43.0 | 2.6 | 24.9 | 28.0 | 9.4 | 14.9 | .2 |
| 1915 | 27.3 | 10.2 | 7.8 | 3.2 | 6.5 | 5.0 | 60.0 | 2.9 | 26.7 | 47.9 | 7.7 | 10.2 | .6 |
| 1916 | 5.4 | 10.1 | 7.0 | 6.7 | 6.7 | 5.4 | 41.3 | 2.9 | 24.2 | 33.5 | 9.5 | 17.4 | .5 |
| 1917 | 4.0 | 3.6 | 3.9 | 1.9 | 2.6 | 1.7 | 17.7 | 1.8 | 9.1 | 12.6 | 4.6 | 6.2 | .1 |
| 1918 | 14.4 | 16.7 | 15.0 | 16.9 | 7.9 | 2.2 | 73.1 | 2.8 | 27.2 | 52.4 | 10.4 | 21.5 | .3 |
| 1919 | 11.7 | 13.8 | 4.3 | 4.0 | 6.6 | 2.3 | 42.7 | 2.4 | 24.3 | 26.0 | 7.6 | 9.2 | .3 |
| 1920 | 33.2 | 21.6 | 12.9 | 6.4 | 10.5 | 8.1 | 92.7 | 5.0 | 44.6 | 62.4 | 8.3 | 17.9 | .7 |
| 1921 | 61.6 | 28.3 | 51.1 | 21.3 | 21.1 | 14.1 | 197.5 | 6.1 | 71.3 | 167.9 | 13.2 | 24.0 | 3.3 |
| 1922 | 38.8 | 15.9 | 24.9 | 11.0 | 10.2 | 9.3 | 110.1 | 6.0 | 42.0 | 99.3 | 8.0 | 20.7 | 1.3 |
| 1923 | 17.7 | 6.3 | 4.7 | 6.4 | 4.4 | 6.0 | 45.5 | 4.4 | 22.9 | 38.3 | 6.4 | 11.3 | .5 |
| 1924 | 18.3 | 11.8 | 10.3 | 5.1 | 9.6 | 5.8 | 60.9 | 3.7 | 30.9 | 50.7 | 8.3 | 7.2 | 1.6 |
| 1925 | 6.1 | 8.0 | 7.7 | 4.5 | 2.8 | 1.8 | 30.9 | 2.1 | 13.9 | 30.0 | 4.1 | 7.7 | .5 |
| 1926 | 31.5 | 35.5 | 20.1 | 10.7 | 20.3 | 16.2 | 137.3 | 6.2 | 80.5 | 79.8 | 6.5 | 9.1 | .9 |
| 1927 | 20.0 | 21.9 | 4.5 | 7.0 | 12.6 | 8.8 | 74.8 | 3.8 | 46.8 | 37.1 | 7.0 | 17.7 | .4 |
| 1928 | 5.0 | 2.8 | 11.7 | 3.2 | 2.0 | 1.4 | 26.1 | 2.3 | 7.1 | 30.1 | 5.4 | 8.2 | .6 |
| 1929 | 16.3 | 11.0 | 6.4 | 5.4 | 4.7 | 3.4 | 47.2 | 2.5 | 21.7 | 40.9 | 4.0 | 6.6 | .8 |

Bureau of Agricultural Economics. Compiled from estimates which are based on percentages of crop on farms as estimated by crop reporters. Stocks as given here are comparable with United States totals in Table 52, except for 1909 and 1910, for which years revisions are not available by States and geographic regions to make them comparable with the latest revisions of the United States total.

TABLE 58.—*Corn: Estimated average price per bushel, received by producers, United States, 1909-1929*

| Year beginning November | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Weighted average |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909 | 69.0 | 60.1 | 63.8 | 65.6 | 65.7 | 64.5 | 64.4 | 65.7 | 66.7 | 66.8 | 63.7 | 56.8 | 63.2 |
| 1910 | 50.3 | 48.1 | 48.6 | 49.0 | 49.3 | 50.8 | 53.4 | 57.6 | 62.9 | 65.8 | 65.8 | 65.2 | 53.5 |
| 1911 | 63.2 | 62.0 | 63.4 | 55.6 | 58.8 | 75.2 | 81.0 | 81.8 | 80.2 | 78.4 | 73.9 | 64.3 | 68.6 |
| 1912 | 53.6 | 48.8 | 49.8 | 51.4 | 53.0 | 55.2 | 58.7 | 61.0 | 64.3 | 70.4 | 75.4 | 73.0 | 56.7 |
| 1913 | 69.9 | 69.4 | 69.0 | 68.7 | 69.9 | 71.4 | 73.6 | 75.2 | 76.2 | 79.2 | 79.8 | 71.4 | 71.8 |
| 1914 | 67.5 | 65.3 | 69.5 | 74.0 | 75.1 | 76.4 | 77.8 | 77.8 | 78.3 | 78.1 | 83.9 | 66.2 | 71.4 |
| 1915 | 59.7 | 59.8 | 64.4 | 67.4 | 69.2 | 71.3 | 73.2 | 74.8 | 77.4 | 81.5 | 83.0 | 83.6 | 69.6 |
| 1916 | 87.0 | 89.4 | 92.9 | 98.4 | 107.2 | 132.0 | 155.4 | 162.4 | 180.6 | 186.0 | 175.3 | 160.6 | 119.0 |
| 1917 | 137.0 | 131.4 | 136.8 | 146.6 | 154.0 | 154.6 | 154.1 | 153.1 | 156.7 | 162.7 | 162.6 | 149.9 | 148.1 |
| 1918 | 138.4 | 140.6 | 141.4 | 137.6 | 143.4 | 156.1 | 166.9 | 173.8 | 183.8 | 188.3 | 189.6 | 143.6 | 153.1 |
| 1919 | 134.0 | 137.4 | 143.6 | 147.6 | 153.6 | 164.1 | 177.4 | 185.4 | 174.6 | 156.7 | 138.5 | 104.3 | 151.5 |
| 1920 | 77.2 | 66.8 | 64.6 | 63.4 | 63.8 | 61.2 | 61.0 | 62.4 | 62.0 | 59.0 | 53.6 | 46.0 | 61.2 |
| 1921 | 41.7 | 42.8 | 44.0 | 50.3 | 55.8 | 58.3 | 60.6 | 61.0 | 63.3 | 63.6 | 62.2 | 62.2 | 54.3 |
| 1922 | 64.3 | 67.6 | 70.2 | 72.5 | 75.3 | 79.6 | 84.0 | 85.8 | 87.0 | 87.0 | 86.2 | 84.8 | 76.7 |
| 1923 | 78.3 | 72.2 | 73.6 | 76.5 | 77.2 | 78.2 | 78.6 | 80.8 | 80.8 | 80.7 | 109.7 | 108.9 | 84.0 |
| 1924 | 99.6 | 105.6 | 112.0 | 114.5 | 112.1 | 103.8 | 107.5 | 111.0 | 104.4 | 106.5 | 98.8 | 83.0 | 105.8 |
| 1925 | 74.6 | 70.7 | 69.6 | 68.5 | 66.6 | 65.7 | 67.1 | 68.6 | 71.5 | 79.5 | 70.2 | 74.5 | 71.0 |
| 1926 | 66.0 | 64.5 | 64.3 | 66.5 | 65.2 | 65.6 | 73.0 | 88.9 | 92.4 | 97.7 | 95.3 | 87.6 | 74.9 |
| 1927 | 73.7 | 75.1 | 75.2 | 79.0 | 86.2 | 91.9 | 102.5 | 102.2 | 102.4 | 98.2 | 95.1 | 84.7 | 85.2 |
| 1928 | 75.4 | 76.1 | 80.2 | 86.8 | 88.7 | 87.5 | 86.2 | 86.9 | 91.2 | 95.9 | 97.2 | 91.9 | 85.8 |
| 1929 | 81.0 | 78.0 | | | | | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of corn for each state; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, November, 1909-December, 1923.

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TABLE 59.—Corn, No. 3, yellow: Weighted average price ¹ per bushel of reported cash sales, Chicago, 1909–1929

| Year beginning November | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Weighted average ¹ |
|----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909..... | 59 | 59 | 64 | 63 | 61 | 57 | 60 | 59 | 62 | 64 | 58 | 50 | 59 |
| 1910..... | 49 | 45 | 45 | 45 | 45 | 50 | 54 | 55 | 63 | 65 | 67 | 73 | 53 |
| 1911..... | 68 | 61 | 62 | 64 | 68 | 78 | 79 | 75 | 68 | 79 | 74 | 65 | 71 |
| 1912..... | 52 | 46 | 46 | 48 | 49 | 55 | 57 | 60 | 62 | 74 | 75 | 70 | 53 |
| 1913..... | 72 | 66 | 62 | 62 | 64 | 67 | 70 | 72 | 71 | 82 | 79 | 73 | 70 |
| 1914..... | 67 | 64 | 71 | 74 | 72 | 75 | 77 | 74 | 78 | 81 | 74 | 65 | 70 |
| 1915..... | 63 | 69 | 74 | 74 | 73 | 76 | 75 | 74 | 81 | 85 | 86 | 96 | 79 |
| 1916..... | 98 | 92 | 98 | 100 | 109 | 140 | 159 | 170 | 199 | 206 | 210 | 203 | 111 |
| 1917..... | 221 | 177 | 177 | 181 | 170 | 165 | 160 | 162 | 170 | 172 | 158 | 141 | 163 |
| 1918..... | 133 | 145 | 143 | 127 | 153 | 162 | 174 | 178 | 192 | 195 | 155 | 141 | 162 |
| 1919..... | 140 | 147 | 151 | 146 | 158 | 169 | 202 | 189 | 158 | 158 | 131 | 91 | 159 |
| 1920..... | 77 | 74 | 65 | 63 | 62 | 57 | 60 | 63 | 60 | 56 | 53 | 45 | 62 |
| 1921..... | 47 | 47 | 48 | 55 | 57 | 58 | 62 | 61 | 64 | 62 | 64 | 69 | 55 |
| 1922..... | 71 | 73 | 70 | 72 | 73 | 79 | 82 | 84 | 88 | 88 | 89 | 104 | 73 |
| 1923..... | 82 | 71 | 76 | 78 | 77 | 77 | 77 | 82 | 109 | 117 | 114 | 110 | 88 |
| 1924..... | 111 | 120 | 124 | 122 | 117 | 105 | 115 | 113 | 108 | 102 | 91 | 82 | 106 |
| 1925..... | 83 | 76 | 79 | 75 | 72 | 71 | 71 | 70 | 78 | 80 | 79 | 77 | 75 |
| 1926..... | 71 | 75 | 74 | 73 | 68 | 71 | 87 | 99 | 102 | 109 | 97 | 84 | 87 |
| 1927..... | 84 | 86 | 89 | 95 | 99 | 106 | 108 | 103 | 106 | 102 | 100 | 96 | 101 |
| 1928..... | 84 | 83 | 93 | 94 | 94 | 90 | 87 | 91 | 99 | 101 | 101 | 95 | 92 |
| 1929..... | 88 | 88 | | | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from Chicago Daily Trade Bulletin. Data for 1893–1903 available in 1924 Yearbook, p. 612, Table 73.

¹ Average of daily prices weighted by car-lot sales.

TABLE 60.—Corn: Weighted average price ¹ per bushel of reported cash sales of all classes and grades, Chicago, and six markets combined, 1918–1929

CHICAGO

| Year beginning November | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Weighted average ¹ |
|----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1918..... | 118.6 | 138.6 | 131.4 | 122.0 | 144.2 | 160.1 | 174.0 | 173.7 | 191.8 | 193.2 | 156.6 | 140.0 | 150.4 |
| 1919..... | 143.8 | 141.6 | 144.9 | 139.5 | 155.1 | 159.7 | 197.4 | 183.3 | 155.3 | 154.9 | 132.2 | 95.9 | 144.1 |
| 1920..... | 78.8 | 72.5 | 62.1 | 59.9 | 60.7 | 54.5 | 61.2 | 59.1 | 59.4 | 56.2 | 53.2 | 46.2 | 56.6 |
| 1921..... | 46.7 | 47.1 | 47.3 | 54.0 | 57.1 | 58.2 | 61.4 | 60.0 | 63.7 | 62.0 | 63.0 | 69.0 | 56.9 |
| 1922..... | 71.1 | 72.4 | 70.1 | 72.5 | 72.8 | 79.3 | 81.8 | 84.0 | 87.1 | 88.2 | 88.8 | 102.4 | 78.1 |
| 1923..... | 76.1 | 69.8 | 74.4 | 75.2 | 74.4 | 76.4 | 76.7 | 82.6 | 100.1 | 117.2 | 114.9 | 110.0 | 86.0 |
| 1924..... | 109.3 | 115.3 | 113.1 | 110.8 | 103.8 | 99.1 | 113.4 | 111.6 | 106.1 | 101.8 | 89.4 | 80.9 | 105.7 |
| 1925..... | 70.3 | 67.8 | 69.5 | 68.1 | 65.2 | 65.3 | 67.4 | 65.7 | 74.0 | 76.1 | 75.9 | 73.1 | 68.4 |
| 1926..... | 66.5 | 65.3 | 64.5 | 62.1 | 59.4 | 66.5 | 81.5 | 91.2 | 96.1 | 105.2 | 92.1 | 79.5 | 74.9 |
| 1927..... | 79.8 | 78.9 | 78.7 | 84.0 | 89.4 | 98.8 | 104.6 | 101.3 | 104.7 | 100.3 | 98.6 | 88.8 | 91.0 |
| 1928..... | 80.7 | 79.8 | 89.0 | 91.2 | 91.7 | 88.0 | 86.1 | 91.5 | 90.9 | 101.0 | 100.9 | 94.6 | 90.5 |
| 1929..... | 81.7 | 81.0 | | | | | | | | | | | |

SIX MARKETS COMBINED ¹

| | | | | | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1918..... | 122.5 | 140.4 | 133.0 | 123.0 | 143.1 | 160.6 | 172.2 | 173.9 | 189.9 | 191.5 | 156.1 | 139.9 | 150.3 |
| 1919..... | 143.2 | 140.4 | 143.2 | 137.9 | 153.1 | 163.8 | 191.7 | 181.0 | 154.8 | 153.2 | 130.1 | 94.3 | 146.5 |
| 1920..... | 76.5 | 68.6 | 60.3 | 58.1 | 58.8 | 52.9 | 58.9 | 48.3 | 57.5 | 54.0 | 51.9 | 45.2 | 55.5 |
| 1921..... | 45.6 | 45.7 | 46.0 | 53.3 | 55.4 | 56.5 | 59.6 | 59.3 | 62.1 | 60.1 | 62.3 | 69.4 | 55.7 |
| 1922..... | 70.8 | 71.6 | 69.2 | 71.6 | 72.4 | 79.0 | 82.1 | 83.1 | 85.6 | 86.4 | 88.3 | 100.3 | 77.4 |
| 1923..... | 74.9 | 67.5 | 72.8 | 73.7 | 72.7 | 74.7 | 75.4 | 82.7 | 106.6 | 114.4 | 113.7 | 109.2 | 83.0 |
| 1924..... | 108.3 | 114.4 | 112.9 | 108.6 | 103.5 | 99.0 | 111.9 | 109.7 | 105.3 | 101.3 | 89.1 | 80.8 | 106.0 |
| 1925..... | 71.0 | 68.3 | 69.5 | 63.2 | 64.6 | 66.4 | 68.0 | 66.9 | 76.3 | 78.3 | 76.5 | 73.2 | 69.0 |
| 1926..... | 67.3 | 65.9 | 65.2 | 62.7 | 60.9 | 67.0 | 83.0 | 91.5 | 96.7 | 104.2 | 92.2 | 79.9 | 75.8 |
| 1927..... | 78.7 | 77.0 | 78.6 | 84.1 | 88.6 | 98.2 | 104.0 | 100.8 | 102.7 | 96.8 | 97.5 | 89.3 | 89.2 |
| 1928..... | 79.8 | 78.4 | 87.1 | 89.5 | 88.0 | 86.9 | 84.6 | 89.7 | 98.1 | 99.9 | 100.0 | 93.8 | 88.6 |
| 1929..... | 81.6 | 79.1 | | | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from Chicago Daily Trade Bulletin, St. Louis Daily Market Reporter, Omaha Daily Price Current, Kansas City Grain Market Review, Minneapolis Daily Market Record, Cincinnati Daily Trade Bulletin. The prices in this table are comparable with prices paid to producers in that the latter are averages of the several prices reported which cover all classes and grades sold by producers.

¹ A average of daily prices weighted by car-lot sales.

* Markets are Chicago, St. Louis, Omaha, Kansas City, Minneapolis, and Cincinnati (not included from November, 1916, through December, 1919.)

TABLE 61.—*Corn, yellow, La Plata: Spot price per bushel of 56 pounds at Buenos Aires, 1912-1929*

| Year beginning November | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Average |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1912..... | 52 | 53 | 54 | 54 | 54 | 56 | 55 | 55 | 55 | 55 | 62 | 59 | 55 |
| 1913..... | 58 | 58 | 55 | 56 | 56 | 54 | 59 | 55 | 57 | 56 | 55 | 49 | 56 |
| 1914..... | 53 | 54 | 54 | 61 | 56 | 57 | 54 | 50 | 51 | 49 | 51 | 51 | 53 |
| 1915..... | 54 | 52 | 56 | 60 | 56 | 51 | 45 | 43 | 45 | 51 | 55 | 70 | 53 |
| 1916..... | 103 | 93 | 107 | 107 | 99 | 103 | 127 | 146 | 143 | 127 | 87 | 85 | 110 |
| 1917..... | 95 | 88 | 79 | 79 | 74 | 59 | 53 | 57 | 64 | 68 | 65 | 63 | 70 |
| 1918..... | 63 | 63 | 57 | 52 | 47 | 55 | 55 | 55 | 96 | 107 | 91 | 79 | 68 |
| 1919..... | 74 | 71 | 70 | 71 | 83 | 103 | 113 | 110 | 96 | 90 | 92 | 83 | 88 |
| 1920..... | 77 | 82 | 88 | 91 | 91 | 78 | 61 | 63 | 65 | 66 | 65 | 58 | 74 |
| 1921..... | 61 | 63 | 63 | 73 | 79 | 77 | 75 | 71 | 78 | 78 | 76 | 74 | 72 |
| 1922..... | 70 | 74 | 80 | 82 | 81 | 80 | 77 | 75 | 73 | 69 | 74 | 78 | 76 |
| 1923..... | 81 | 79 | 78 | 82 | 77 | 67 | 65 | 57 | 68 | 85 | 93 | 105 | 78 |
| 1924..... | 106 | 107 | 112 | 108 | 96 | 92 | 100 | 92 | 93 | 96 | 91 | 82 | 98 |
| 1925..... | 84 | 86 | 78 | 73 | 69 | 70 | 68 | 68 | 68 | 70 | 65 | 60 | 71 |
| 1926..... | 56 | 55 | 60 | 63 | 62 | 60 | 60 | 63 | 70 | 76 | 77 | 76 | 65 |
| 1927..... | 75 | 83 | 86 | 97 | 102 | 95 | 90 | 91 | 90 | 86 | 91 | 94 | 91 |
| 1928..... | 97 | 93 | 97 | 99 | 90 | 91 | 79 | 87 | 87 | 87 | 87 | 84 | 90 |
| 1929..... | 82 | 79 | | | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from International Yearbook of Agricultural Statistics, 1912-1921; subsequently Review of the River Plate. Average of weekly quotations. Conversions at monthly average rate of exchange as given in Federal Reserve Bulletins.

¹ Interpolation, no quotation.

TABLE 62.—*Corn, yellow, La Plata: Spot price per bushel of 56 pounds at Liverpool, 1912-1929*

| Year beginning November | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Average |
|-------------------------|--------------|--------------|------------------|------------------|------------------|--------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1912..... | 68 | 67 | 71 | 75 | 76 | 74 | 72 | 69 | 67 | 67 | 70 | 66 | 70 |
| 1913..... | 63 | 67 | 65 | 66 | 68 | 68 | 74 | 76 | 78 | 97 | 93 | 83 | 75 |
| 1914..... | 78 | 83 | 98 | 106 | 102 | 106 | 111 | 97 | 92 | 90 | 85 | 94 | 95 |
| 1915..... | 106 | 119 | 140 | 144 | 142 | 143 | 147 | 133 | 145 | 154 | 139 | 148 | 138 |
| 1916..... | 169 | 181 | 189 | 192 | 200 | 216 | (¹) | 217 | 217 | 217 | 217 | 217 | 203 |
| 1917..... | 217 | 217 | 223 | 223 | 223 | 223 | 223 | 223 | 242 | 261 | 261 | 261 | 233 |
| 1918..... | 261 | 261 | 204 | 204 | 175 | 174 | 174 | 172 | 165 | 166 | 169 | 168 | 191 |
| 1919..... | 165 | 152 | ² 149 | ² 177 | ² 196 | 197 | 181 | 167 | 153 | 143 | 160 | 149 | 166 |
| 1920..... | 115 | 125 | 128 | 122 | 130 | 128 | 118 | 109 | 105 | 93 | 83 | 72 | 111 |
| 1921..... | 78 | 88 | 92 | 108 | 108 | 103 | 106 | 101 | 110 | 110 | 109 | 108 | 102 |
| 1922..... | 96 | 100 | 99 | 104 | 105 | 109 | 114 | 110 | 102 | 94 | 98 | 97 | 102 |
| 1923..... | 96 | 102 | 103 | 115 | 111 | 107 | 112 | 100 | 94 | 104 | 114 | 124 | 107 |
| 1924..... | 121 | 122 | 131 | 129 | 114 | 111 | 130 | 128 | 127 | 138 | 120 | 103 | 123 |
| 1925..... | 107 | 110 | 97 | 91 | 89 | 94 | 89 | 87 | 100 | 98 | 90 | 93 | 95 |
| 1926..... | 95 | 92 | 89 | 93 | 87 | 88 | 94 | 93 | 91 | 98 | 97 | 96 | 93 |
| 1927..... | 97 | 104 | 110 | 119 | 127 | 129 | 127 | 125 | 123 | 119 | 107 | 116 | 117 |
| 1928..... | 123 | 120 | 124 | 127 | 124 | 120 | 107 | 104 | 118 | 113 | 107 | 108 | 116 |
| 1929..... | 99 | 89 | | | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from International Yearbook of Agricultural Statistics 1912-1921; subsequently Broomhall's Corn Trade News. Conversions at monthly average rate of exchange as given in Federal Reserve Bulletins to December, 1925, inclusive; subsequently at par of exchange

¹ Not quoted.

² Afloat price.

³ Nominal.

TABLE 63.—*Corn futures: Volume of trading in all "contract" markets, by months 1923-24 to 1928-29*

| Year and market | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May |
|-----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| 1923-24..... | 394, 517 | 284, 884 | 457, 145 | 337, 730 | 441, 631 | 323, 270 | 287, 875 |
| 1924-25..... | 557, 304 | 706, 562 | 706, 377 | 677, 274 | 810, 362 | 669, 751 | 510, 347 |
| 1925-26..... | 317, 253 | 514, 258 | 302, 297 | 236, 083 | 316, 906 | 291, 590 | 237, 152 |
| 1926-27..... | 383, 247 | 394, 929 | 261, 079 | 287, 881 | 428, 858 | 312, 646 | 662, 490 |
| 1927-28..... | 472, 862 | 681, 076 | 510, 743 | 698, 043 | 732, 790 | 745, 222 | 699, 564 |
| 1928-29..... | 457, 429 | 419, 906 | 689, 843 | 372, 926 | 415, 705 | 466, 393 | 825, 642 |
| Chicago Board of Trade..... | 418, 806 | 384, 587 | 636, 665 | 340, 898 | 380, 331 | 426, 574 | 482, 265 |
| Chicago Open Board..... | 12, 946 | 9, 666 | 19, 718 | 18, 968 | 13, 141 | 12, 127 | 14, 512 |
| Kansas City..... | 20, 736 | 21, 036 | 27, 243 | 16, 959 | 18, 115 | 23, 787 | 25, 360 |
| St. Louis..... | 1, 740 | 1, 174 | 1, 971 | 1, 285 | 1, 611 | 1, 258 | 879 |
| Milwaukee..... | 3, 201 | 3, 443 | 4, 246 | 2, 321 | 2, 507 | 2, 647 | 2, 626 |

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TABLE 63.—*Corn futures: Volume of trading in all "contract" markets, by months 1923-24 to 1928-29—Continued*

| Year and market | June | July | Aug. | Sept. | Oct. | Total |
|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1923-24 | 426,225 | 565,184 | 740,107 | 694,881 | 677,665 | 5,631,114 |
| 1924-25 | 565,855 | 462,734 | 394,331 | 441,945 | 335,161 | 6,841,003 |
| 1925-26 | 342,491 | 448,305 | 438,929 | 367,625 | 340,191 | 4,153,080 |
| 1926-27 | 921,473 | 575,266 | 712,669 | 835,732 | 587,568 | 6,393,838 |
| 1927-28 | 566,913 | 553,603 | 615,609 | 371,817 | 466,952 | 7,115,194 |
| 1928-29 | 475,255 | 519,678 | 452,684 | 296,188 | 268,949 | 5,300,551 |
| Chicago Board of Trade | 436,467 | 481,869 | 418,505 | 271,827 | 245,604 | 4,924,398 |
| Chicago Open Board | 11,125 | 11,414 | 8,814 | 8,025 | 8,025 | 144,485 |
| Kansas City | 24,161 | 22,771 | 21,496 | 13,343 | 13,075 | 247,082 |
| St. Louis | 794 | 377 | 316 | 235 | 245 | 22,537 |
| Milwaukee | 2,708 | 3,247 | 1,791 | 1,969 | 2,000 | 32,706 |

Grain Futures Administration.

TABLE 64.—*Oats: Acreage, production, value, exports, etc., United States, 1900-1929*

| Year | Acreage harvested | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Price per bushel at Chicago, year beginning Aug. 1 ¹ | Foreign trade, including meal, year beginning July 1 ² | | | |
|-------------------|-------------------|------------------------|---------------|---|-------------------|---|---|---------------|--------------------------|------------------------|
| | | | | | | | Domestic exports | Imports | Net exports ³ | |
| | | | | | | | | | Total | Per cent of production |
| | 1,000 acres | Bushels of 52 lbs. | 1,000 bushels | Cents | 1,000 dollars | Cents | 1,000 bushels | 1,000 bushels | 1,000 bushels | Per cent |
| 1900 | 30,290 | 30.2 | 913,800 | 25.4 | 232,074 | 26 | 42,269 | 32 | 42,237 | 4.6 |
| 1901 | 29,894 | 26.0 | 778,392 | 39.7 | 308,796 | 43 | 13,278 | 39 | 13,240 | 1.7 |
| 1902 | 30,578 | 34.5 | 1,053,489 | 30.6 | 322,423 | 34 | 8,382 | 150 | 8,233 | .8 |
| 1903 | 30,866 | 28.2 | 869,350 | 34.0 | 295,232 | 38 | 1,961 | 184 | 1,877 | .2 |
| 1904 | 31,353 | 32.2 | 1,008,931 | 31.1 | 313,488 | 32 | 8,395 | 56 | 8,339 | .8 |
| 1905 | 32,072 | 34.0 | 1,090,236 | 28.9 | 314,868 | 31 | 48,435 | 40 | 48,395 | 4.4 |
| 1906 | 33,353 | 31.0 | 1,035,576 | 31.9 | 329,853 | 37 | 6,386 | 91 | 6,379 | .6 |
| 1907 | 33,641 | 23.9 | 805,108 | 44.5 | 358,421 | 50 | 2,519 | 383 | 2,195 | .3 |
| 1908 | 34,006 | 25.0 | 850,546 | 47.3 | 402,010 | 52 | 2,334 | 6,692 | 4,422 | ..... |
| 1909 | 35,159 | 30.4 | 1,068,289 | 40.6 | 433,869 | 42 | 2,549 | 1,063 | 1,704 | .2 |
| 1910 | 37,548 | 31.6 | 1,180,341 | 34.4 | 408,388 | 33 | 3,846 | 140 | 3,707 | .3 |
| 1911 | 37,763 | 24.4 | 922,298 | 45.0 | 414,663 | 50 | 2,678 | 2,660 | 30 | (⁴) |
| 1912 | 37,917 | 37.4 | 1,418,337 | 31.9 | 452,469 | 35 | 36,455 | 765 | 35,695 | 2.5 |
| 1913 | 38,399 | 29.2 | 1,121,768 | 39.2 | 439,596 | 40 | 2,749 | 22,333 | 18,584 | ..... |
| 1914 | 38,442 | 29.7 | 1,141,060 | 43.8 | 499,431 | 50 | 100,609 | 670 | 100,158 | 8.8 |
| 1915 | 40,996 | 37.8 | 1,549,030 | 36.1 | 559,506 | 41 | 98,960 | 720 | 98,648 | 6.4 |
| 1916 | 41,527 | 30.1 | 1,251,837 | 52.4 | 655,928 | 54 | 95,106 | 841 | 94,348 | 7.5 |
| 1917 | 43,553 | 36.6 | 1,592,740 | 66.6 | 1,061,474 | 71 | 125,091 | 2,915 | 122,273 | 7.7 |
| 1918 | 44,349 | 34.7 | 1,538,124 | 70.9 | 1,090,322 | 70 | 109,005 | 838 | 108,167 | 7.0 |
| 1919 | 37,891 | 27.8 | 1,055,183 | ..... | ..... | 80 | 43,436 | 6,077 | 37,365 | 3.2 |
| 1919 | 40,359 | 29.3 | 1,184,030 | 70.4 | 833,922 | 51 | 9,399 | 3,827 | 5,572 | .4 |
| 1920 | 42,491 | 35.2 | 1,496,281 | 46.0 | 688,311 | 35 | 21,297 | 1,824 | 19,472 | 1.8 |
| 1921 | 45,495 | 37.7 | 1,078,341 | 30.2 | 325,954 | 41 | 25,413 | 340 | 25,087 | 2.1 |
| 1922 | 40,790 | 29.8 | 1,215,803 | 39.4 | 478,048 | 45 | 8,796 | 4,271 | 4,525 | .3 |
| 1923 | 40,981 | 31.9 | 1,305,883 | 41.4 | 541,137 | 45 | ..... | ..... | ..... | ..... |
| 1924 | 37,650 | 34.7 | 1,304,589 | ..... | ..... | 50 | 16,777 | 3,087 | 13,690 | .9 |
| 1924 | 42,110 | 35.7 | 1,502,529 | 47.7 | 717,189 | 41 | 39,687 | 212 | 39,555 | 2.7 |
| 1925 | 44,872 | 33.2 | 1,487,550 | 38.0 | 565,506 | 43 | 15,041 | 135 | 14,908 | 1.2 |
| 1926 | 44,177 | 28.2 | 1,246,848 | 39.8 | 496,582 | 55 | 9,823 | 233 | 9,611 | .8 |
| 1927 | 41,941 | 28.2 | 1,182,594 | 45.0 | 531,762 | 44 | 16,242 | 426 | 15,817 | 1.1 |
| 1928 | 41,734 | 34.5 | 1,439,407 | 40.9 | 589,048 | ..... | ..... | ..... | ..... | ..... |
| 1929 ⁵ | 40,217 | 30.8 | 1,238,654 | 43.5 | 538,445 | ..... | ..... | ..... | ..... | ..... |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; Italian figures are census returns. See 1927 Yearbook, page 788, for data for earlier years.

¹ From Chicago Daily Trade Bulletin, averages of the daily cash quotations of No. 3 white oats weighted by ear-lot sales.

² Compiled from Commerce and Navigation of the United States, 1900-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1926; January and June issues, 1927-1929, and official records of the Bureau of Foreign and Domestic Commerce. Oats—general imports, 1900-1929; oatmeal—general imports, 1900-1909; imports for consumption, 1910-1929.

³ Total exports (domestic plus foreign) minus total imports.

⁴ Net imports. Total imports minus total exports (domestic plus foreign).

⁵ Less than 0.05 per cent.

⁶ Preliminary.

TABLE 65.—Oats: Acreage harvested and production, by States, average 1923-1927, annual 1926-1929

| State and division | Acreage harvested | | | | | Production | | | | |
|--------------------|--------------------|-------------|-------------|-------------|-------------------|--------------------|---------------|---------------|---------------|-------------------|
| | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ¹ | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Maine | 120 | 136 | 124 | 120 | 122 | 5,041 | 5,168 | 4,588 | 4,200 | 4,480 |
| New Hampshire | 13 | 11 | 11 | 10 | 10 | 488 | 440 | 429 | 390 | 400 |
| Vermont | 81 | 82 | 83 | 79 | 71 | 3,068 | 3,116 | 3,237 | 2,086 | 2,738 |
| Massachusetts | 9 | 9 | 8 | 7 | 7 | 303 | 306 | 280 | 224 | 266 |
| Rhode Island | 2 | 3 | 2 | 2 | 2 | 64 | 96 | 64 | 50 | 70 |
| Connecticut | 13 | 15 | 15 | 15 | 14 | 411 | 480 | 480 | 405 | 420 |
| New York | 998 | 1,017 | 1,000 | 1,020 | 989 | 34,555 | 34,578 | 35,000 | 33,660 | 24,626 |
| New Jersey | 53 | 50 | 49 | 50 | 47 | 1,597 | 1,650 | 1,764 | 1,500 | 1,410 |
| Pennsylvania | 1,109 | 1,111 | 1,100 | 1,067 | 1,014 | 37,159 | 35,552 | 39,600 | 34,678 | 29,913 |
| North Atlantic | 2,406 | 2,434 | 2,392 | 2,370 | 2,279 | 82,686 | 81,386 | 85,442 | 77,799 | 64,713 |
| Ohio | 1,799 | 1,980 | 1,900 | 2,413 | 1,689 | 67,388 | 75,210 | 60,800 | 89,281 | 49,836 |
| Indiana | 1,950 | 2,050 | 1,948 | 2,430 | 1,895 | 57,626 | 61,500 | 48,700 | 89,910 | 54,008 |
| Illinois | 4,352 | 4,661 | 4,098 | 4,649 | 4,231 | 137,839 | 123,516 | 102,204 | 174,338 | 111,738 |
| Michigan | 1,569 | 1,570 | 1,617 | 1,633 | 1,372 | 53,078 | 51,810 | 54,170 | 58,461 | 40,886 |
| Wisconsin | 2,546 | 2,577 | 2,422 | 2,495 | 2,470 | 102,379 | 96,638 | 93,247 | 108,532 | 85,215 |
| Minnesota | 4,488 | 4,532 | 4,350 | 4,089 | 4,212 | 169,745 | 129,162 | 116,580 | 153,338 | 153,738 |
| Iowa | 6,014 | 6,218 | 6,001 | 6,004 | 5,944 | 217,338 | 195,867 | 192,032 | 231,154 | 219,928 |
| Missouri | 1,734 | 2,173 | 1,565 | 1,706 | 1,535 | 39,063 | 43,460 | 28,605 | 47,768 | 33,770 |
| North Dakota | 2,301 | 2,024 | 2,125 | 1,934 | 1,934 | 57,504 | 34,408 | 45,688 | 59,954 | 34,812 |
| South Dakota | 2,501 | 1,984 | 2,550 | 2,193 | 2,289 | 75,496 | 23,213 | 74,715 | 59,211 | 64,382 |
| Nebraska | 2,518 | 2,537 | 2,441 | 2,392 | 2,480 | 69,220 | 52,516 | 69,813 | 78,936 | 86,301 |
| Kansas | 1,469 | 1,626 | 1,301 | 1,301 | 1,197 | 34,841 | 35,122 | 30,574 | 37,729 | 28,249 |
| North Central | 33,242 | 33,932 | 32,228 | 33,239 | 31,218 | 1,071,519 | 922,452 | 915,128 | 1,188,612 | 992,856 |
| Delaware | 5 | 4 | 4 | 4 | 3 | 126 | 112 | 116 | 120 | 84 |
| Maryland | 53 | 52 | 51 | 54 | 43 | 1,713 | 1,706 | 1,708 | 1,701 | 1,333 |
| Virginia | 181 | 186 | 186 | 182 | 167 | 4,156 | 4,836 | 3,969 | 4,641 | 3,811 |
| West Virginia | 192 | 207 | 217 | 204 | 216 | 4,885 | 5,796 | 5,251 | 5,712 | 5,616 |
| North Carolina | 280 | 310 | 273 | 191 | 258 | 5,740 | 6,820 | 5,733 | 4,202 | 6,192 |
| South Carolina | 410 | 416 | 449 | 337 | 408 | 9,148 | 10,483 | 10,327 | 7,751 | 11,016 |
| Georgia | 425 | 475 | 442 | 265 | 424 | 8,174 | 10,925 | 9,282 | 5,300 | 9,540 |
| Florida | 16 | 12 | 11 | 11 | 12 | 209 | 200 | 121 | 191 | 168 |
| South Atlantic | 1,562 | 1,602 | 1,633 | 1,248 | 1,531 | 34,151 | 40,878 | 36,537 | 29,618 | 37,790 |
| Kentucky | 236 | 259 | 215 | 305 | 290 | 5,159 | 6,346 | 4,085 | 7,930 | 6,235 |
| Tennessee | 212 | 276 | 179 | 188 | 197 | 4,565 | 6,900 | 3,043 | 4,012 | 3,546 |
| Alabama | 148 | 107 | 101 | 70 | 119 | 2,587 | 2,354 | 1,768 | 1,225 | 2,320 |
| Mississippi | 74 | 41 | 48 | 41 | 55 | 1,382 | 902 | 912 | 820 | 1,210 |
| Arkansas | 247 | 213 | 207 | 155 | 180 | 4,872 | 5,346 | 4,140 | 3,410 | 4,836 |
| Louisiana | 35 | 30 | 35 | 44 | 48 | 754 | 798 | 612 | 1,078 | 1,200 |
| Oklahoma | 1,198 | 1,340 | 1,112 | 890 | 792 | 27,774 | 37,520 | 21,128 | 23,140 | 20,592 |
| Texas | 1,577 | 1,994 | 2,003 | 1,402 | 1,682 | 46,492 | 83,696 | 42,063 | 35,751 | 47,096 |
| South Central | 3,727 | 4,290 | 3,900 | 3,095 | 3,309 | 93,585 | 143,832 | 77,751 | 77,396 | 87,035 |
| Montana | 613 | 641 | 596 | 554 | 554 | 18,510 | 16,966 | 23,840 | 20,221 | 9,418 |
| Idaho | 151 | 119 | 143 | 137 | 151 | 6,642 | 4,700 | 6,721 | 6,439 | 0,040 |
| Wyoming | 133 | 120 | 120 | 132 | 115 | 4,514 | 4,200 | 4,320 | 3,828 | 4,205 |
| Colorado | 211 | 195 | 189 | 193 | 212 | 5,794 | 4,680 | 5,481 | 5,983 | 6,672 |
| New Mexico | 47 | 54 | 30 | 36 | 43 | 1,034 | 1,512 | 660 | 720 | 1,161 |
| Arizona | 15 | 15 | 17 | 14 | 15 | 469 | 525 | 612 | 532 | 480 |
| Utah | 60 | 54 | 51 | 55 | 58 | 2,396 | 2,160 | 2,142 | 2,475 | 2,436 |
| Nevada | 2 | 2 | 2 | 2 | 2 | 78 | 64 | 80 | 80 | 70 |
| Washington | 210 | 229 | 183 | 201 | 191 | 9,776 | 9,847 | 9,150 | 9,447 | 8,977 |
| Oregon | 297 | 304 | 310 | 304 | 301 | 9,057 | 8,816 | 10,540 | 10,944 | 12,464 |
| California | 140 | 156 | 147 | 154 | 145 | 4,266 | 5,070 | 4,190 | 5,313 | 4,437 |
| Far Western | 1,880 | 1,889 | 1,788 | 1,782 | 1,820 | 63,140 | 58,300 | 67,736 | 66,982 | 66,260 |
| United States | 42,816 | 44,177 | 41,941 | 41,734 | 40,217 | 1,345,081 | 1,246,848 | 1,182,594 | 1,439,407 | 1,238,654 |

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¹ Preliminary.

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TABLE 66.—Oats: Yield per acre and estimated price per bushel, December 1, by States, averages, and annual 1924-1929

| State and division | Yield per acre | | | | | | | | Estimated price per bushel | | | | | | | |
|---------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------|----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Av., 1918- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Av., 1923- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | | |
| | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| Maine..... | 38.4 | 38.0 | 45.0 | 38.0 | 37.0 | 35.0 | 40.0 | 61 | 65 | 55 | 63 | 68 | 70 | 70 | 70 | 70 |
| New Hampshire..... | 37.8 | 39.0 | 39.0 | 40.0 | 39.0 | 39.0 | 40.0 | 67 | 73 | 64 | 65 | 70 | 65 | 70 | 65 | 70 |
| Vermont..... | 36.2 | 38.0 | 40.0 | 38.0 | 39.0 | 34.0 | 37.0 | 63 | 69 | 59 | 60 | 65 | 70 | 65 | 70 | 65 |
| Massachusetts..... | 34.8 | 34.0 | 38.0 | 34.0 | 35.0 | 32.0 | 38.0 | 68 | 70 | 65 | 70 | 70 | 70 | 70 | 70 | 70 |
| Rhode Island..... | 31.8 | 30.0 | 33.0 | 32.0 | 32.0 | 28.0 | 30.0 | 69 | 75 | 65 | 70 | 75 | 70 | 75 | 70 | 75 |
| Connecticut..... | 31.0 | 29.0 | 33.0 | 32.0 | 32.0 | 27.0 | 30.0 | 66 | 70 | 61 | 66 | 69 | 70 | 70 | 70 | 70 |
| New York..... | 33.2 | 36.0 | 36.0 | 34.0 | 35.0 | 33.0 | 24.9 | 55 | 62 | 52 | 50 | 55 | 54 | 58 | 58 | 58 |
| New Jersey..... | 31.0 | 30.0 | 30.0 | 33.0 | 36.0 | 30.0 | 30.0 | 55 | 64 | 54 | 50 | 53 | 53 | 57 | 57 | 57 |
| Pennsylvania..... | 34.0 | 36.0 | 35.0 | 32.0 | 36.0 | 32.5 | 29.5 | 54 | 62 | 51 | 49 | 54 | 53 | 57 | 57 | 57 |
| North Atlantic..... | 33.9 | 36.0 | 36.0 | 33.4 | 35.7 | 32.8 | 28.4 | 55.2 | 62.6 | 52.2 | 51.0 | 55.8 | 55.1 | 58.9 | | |
| Ohio..... | 35.8 | 41.0 | 41.5 | 38.0 | 32.0 | 37.0 | 29.5 | 44 | 52 | 39 | 39 | 45 | 42 | 45 | | |
| Indiana..... | 30.8 | 37.0 | 28.0 | 30.0 | 25.0 | 37.0 | 28.5 | 40 | 48 | 37 | 35 | 43 | 37 | 40 | | |
| Illinois..... | 32.7 | 39.0 | 32.5 | 26.5 | 25.5 | 37.5 | 33.5 | 40 | 47 | 35 | 35 | 43 | 38 | 40 | | |
| Michigan..... | 32.6 | 38.8 | 32.0 | 33.0 | 33.5 | 35.8 | 29.8 | 44 | 48 | 40 | 40 | 48 | 43 | 48 | | |
| Wisconsin..... | 39.1 | 40.0 | 48.5 | 37.5 | 38.5 | 43.5 | 34.5 | 43 | 48 | 38 | 40 | 47 | 43 | 44 | | |
| Minnesota..... | 31.3 | 48.0 | 42.0 | 28.5 | 24.8 | 37.5 | 36.5 | 36 | 43 | 31 | 34 | 40 | 35 | 37 | | |
| Iowa..... | 36.0 | 42.0 | 39.2 | 31.5 | 32.0 | 38.5 | 37.0 | 38 | 41 | 32 | 35 | 42 | 37 | 39 | | |
| Missouri..... | 23.6 | 25.0 | 26.0 | 20.0 | 17.0 | 28.0 | 22.0 | 46 | 51 | 41 | 42 | 47 | 42 | 47 | | |
| North Dakota..... | 23.8 | 34.0 | 27.0 | 17.0 | 21.5 | 31.0 | 18.0 | 32 | 36 | 27 | 33 | 35 | 30 | 32 | | |
| South Dakota..... | 30.1 | 37.0 | 34.0 | 11.7 | 29.3 | 27.0 | 28.5 | 34 | 40 | 28 | 36 | 36 | 33 | 31 | | |
| Nebraska..... | 27.8 | 28.0 | 27.4 | 20.7 | 28.6 | 33.0 | 31.3 | 59 | 43 | 36 | 10 | 40 | 38 | 38 | | |
| Kansas..... | 23.9 | 25.0 | 23.0 | 21.6 | 23.5 | 29.0 | 23.6 | 45 | 47 | 41 | 41 | 45 | 42 | 46 | | |
| North Central..... | 32.0 | 37.5 | 34.9 | 27.2 | 28.4 | 35.8 | 31.8 | 39.1 | 44.8 | 34.4 | 36.9 | 42.2 | 38.0 | 39.8 | | |
| Delaware..... | 28.0 | 30.0 | 25.0 | 28.0 | 29.0 | 30.0 | 28.0 | 64 | 66 | 65 | 59 | 68 | 60 | 57 | | |
| Maryland..... | 31.3 | 34.0 | 32.0 | 32.8 | 33.5 | 31.5 | 31.0 | 55 | 64 | 53 | 50 | 54 | 56 | 59 | | |
| Virginia..... | 22.2 | 23.5 | 21.5 | 26.0 | 21.5 | 27.5 | 23.0 | 66 | 72 | 70 | 63 | 64 | 61 | 67 | | |
| West Virginia..... | 24.7 | 24.0 | 27.0 | 28.0 | 21.2 | 28.0 | 26.0 | 64 | 73 | 62 | 59 | 64 | 63 | 64 | | |
| North Carolina..... | 19.7 | 18.0 | 19.0 | 22.0 | 21.0 | 22.0 | 21.0 | 75 | 81 | 76 | 69 | 72 | 78 | 75 | | |
| South Carolina..... | 22.8 | 19.5 | 19.0 | 25.2 | 23.0 | 23.0 | 27.0 | 82 | 97 | 90 | 67 | 75 | 88 | 80 | | |
| Georgia..... | 19.4 | 15.5 | 17.0 | 23.0 | 21.0 | 20.0 | 22.5 | 82 | 95 | 87 | 69 | 75 | 85 | 80 | | |
| Florida..... | 11.3 | 13.5 | 14.0 | 16.7 | 11.0 | 17.4 | 14.0 | 81 | 90 | 90 | 65 | 80 | 88 | 89 | | |
| South Atlantic..... | 21.7 | 20.0 | 20.2 | 21.6 | 22.1 | 23.7 | 24.7 | 74.8 | 81.5 | 77.4 | 65.5 | 70.8 | 75.5 | 74.7 | | |
| Kentucky..... | 21.6 | 23.2 | 21.0 | 24.5 | 19.0 | 26.0 | 21.5 | 59 | 67 | 59 | 53 | 60 | 57 | 59 | | |
| Tennessee..... | 20.8 | 21.0 | 22.0 | 25.0 | 17.0 | 21.5 | 18.0 | 62 | 69 | 64 | 55 | 60 | 60 | 62 | | |
| Alabama..... | 18.6 | 15.0 | 17.0 | 22.0 | 17.5 | 17.5 | 19.5 | 77 | 87 | 78 | 68 | 70 | 75 | 76 | | |
| Mississippi..... | 18.7 | 16.0 | 19.0 | 22.0 | 19.0 | 20.0 | 22.0 | 75 | 85 | 78 | 66 | 70 | 75 | 76 | | |
| Arkansas..... | 21.8 | 18.0 | 16.0 | 22.0 | 20.0 | 22.0 | 26.0 | 59 | 64 | 58 | 52 | 58 | 59 | 62 | | |
| Louisiana..... | 22.2 | 20.0 | 21.0 | 26.6 | 17.5 | 24.5 | 25.0 | 72 | 83 | 80 | 61 | 66 | 65 | 70 | | |
| Oklahoma..... | 24.4 | 25.0 | 23.0 | 28.0 | 19.0 | 26.0 | 26.0 | 47 | 53 | 51 | 37 | 41 | 47 | 48 | | |
| Texas..... | 26.2 | 34.0 | 12.3 | 42.6 | 21.0 | 25.5 | 28.0 | 53 | 59 | 63 | 38 | 47 | 51 | 51 | | |
| South Central..... | 24.4 | 27.2 | 18.2 | 33.8 | 19.9 | 25.0 | 25.8 | 52.9 | 59.2 | 58.1 | 40.5 | 48.9 | 52.1 | 53.2 | | |
| Montana..... | 26.5 | 29.5 | 22.5 | 26.0 | 40.0 | 36.5 | 17.0 | 47 | 47 | 53 | 53 | 41 | 11 | 51 | | |
| Idaho..... | 40.7 | 36.0 | 49.0 | 40.0 | 47.0 | 47.0 | 40.0 | 48 | 58 | 43 | 45 | 50 | 38 | 48 | | |
| Wyoming..... | 32.2 | 30.0 | 35.0 | 35.0 | 36.0 | 29.0 | 29.0 | 48 | 58 | 46 | 45 | 42 | 45 | 51 | | |
| Colorado..... | 28.1 | 25.0 | 27.0 | 24.0 | 29.0 | 31.0 | 31.0 | 49 | 58 | 50 | 44 | 48 | 45 | 48 | | |
| New Mexico..... | 23.6 | 20.0 | 20.0 | 28.0 | 22.0 | 20.0 | 27.0 | 61 | 60 | 64 | 56 | 56 | 60 | 60 | | |
| Arizona..... | 32.7 | 28.0 | 30.0 | 35.0 | 36.0 | 38.0 | 32.0 | 76 | 81 | 75 | 75 | 70 | 75 | 80 | | |
| Utah..... | 38.2 | 32.8 | 47.0 | 40.0 | 42.0 | 45.0 | 42.0 | 62 | 70 | 62 | 60 | 60 | 56 | 60 | | |
| Nevada..... | 35.3 | 30.0 | 40.0 | 32.0 | 40.0 | 40.0 | 35.0 | 69 | 72 | 65 | 62 | 65 | 65 | 70 | | |
| Washington..... | 43.5 | 38.5 | 44.0 | 43.0 | 50.0 | 47.0 | 47.0 | 54 | 59 | 52 | 53 | 56 | 55 | 59 | | |
| Oregon..... | 31.3 | 28.0 | 33.0 | 29.0 | 34.0 | 36.0 | 41.0 | 52 | 61 | 51 | 50 | 53 | 51 | 56 | | |
| California..... | 29.9 | 18.2 | 34.7 | 32.5 | 28.5 | 34.5 | 30.6 | 64 | 87 | 61 | 48 | 63 | 60 | 61 | | |
| Far Western..... | 31.7 | 29.4 | 32.4 | 30.9 | 37.9 | 37.0 | 30.9 | 51.0 | 56.6 | 51.7 | 50.7 | 49.9 | 48.5 | 54.3 | | |
| United States..... | 31.0 | 35.7 | 33.2 | 28.2 | 28.2 | 34.5 | 30.8 | 42.4 | 47.7 | 38.0 | 39.8 | 45.0 | 40.9 | 43.5 | | |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

TABLE 67.—Oats: Acreage, yield per acre, and production in specified countries, average 1909-1913, 1921-1925, annual, 1927-1929

| Country | Acreage | | | | Yield per acre | | | | Production | | | |
|--|---------------------------------|--------------------|--------|--------|-------------------|---------------------------------|--------------------|------|------------|-------------------|---------------------------------|--------------------|
| | Average, 1909-1913 ¹ | Average, 1921-1925 | 1927 | 1928 | 1929, preliminary | Average, 1909-1913 ¹ | Average, 1921-1925 | 1927 | 1928 | 1929, preliminary | Average, 1909-1913 ¹ | Average, 1921-1925 |
| NORTHERN HEMISPHERE | | | | | | | | | | | | |
| NORTH AMERICA | | | | | | | | | | | | |
| Canada..... | 9,597 | 14,585 | 13,240 | 13,137 | 12,479 | 48.6 | 31.4 | 33.2 | 34.4 | 22.7 | 351,690 | 457,948 |
| United States..... | 37,337 | 42,850 | 41,941 | 41,734 | 40,217 | 30.6 | 30.9 | 28.2 | 34.5 | 30.8 | 1,138,021 | 1,182,584 |
| Total..... | 46,934 | 57,435 | 55,181 | 54,871 | 52,696 | 31.8 | 30.9 | 29.4 | 34.5 | 28.9 | 1,493,097 | 1,772,307 |
| EUROPE | | | | | | | | | | | | |
| England and Wales..... | 2,039 | 2,039 | 1,751 | 1,763 | 1,854 | 47.5 | 47.5 | 53.7 | 57.3 | 57.8 | 96,913 | 96,796 |
| Scotland..... | 952 | 970 | 897 | 878 | 889 | 46.8 | 49.0 | 48.4 | 56.1 | 59.4 | 44,507 | 47,563 |
| Ireland..... | 699 | 736 | 645 | 649 | 666 | 63.5 | 49.3 | 72.5 | 68.7 | 63.9 | 44,333 | 36,311 |
| Northern Ireland..... | 350 | 344 | 310 | 307 | 314 | 59.5 | 54.0 | 62.3 | 63.0 | 63.9 | 20,816 | 18,582 |
| Norway..... | 264 | 274 | 240 | 246 | 246 | 38.9 | 41.6 | 52.8 | 51.5 | 46.8 | 10,276 | 11,406 |
| Sweden..... | 1,961 | 1,807 | 1,723 | 1,716 | 1,755 | 43.9 | 41.7 | 43.8 | 48.5 | 46.8 | 86,050 | 75,374 |
| Denmark..... | 1,161 | 1,119 | 1,012 | 999 | 968 | 52.2 | 54.1 | 60.1 | 73.0 | 73.3 | 60,557 | 60,542 |
| Netherlands..... | 1,346 | 380 | 368 | 377 | 394 | 51.4 | 51.4 | 57.5 | 65.8 | 64.2 | 15,070 | 19,531 |
| Belgium..... | 668 | 656 | 658 | 667 | 729 | 65.8 | 62.4 | 70.1 | 72.7 | 66.9 | 43,964 | 40,954 |
| Luxembourg..... | 77 | 70 | 70 | 71 | 75 | 43.9 | 30.4 | 39.5 | 42.3 | 44.7 | 3,382 | 2,130 |
| France..... | 10,084 | 8,521 | 8,544 | 8,657 | 8,665 | 36.5 | 35.3 | 40.2 | 36.3 | 45.7 | 368,462 | 300,569 |
| Spain..... | 1,276 | 1,623 | 1,909 | 1,956 | 1,700 | 22.8 | 22.1 | 20.5 | 17.5 | 22.3 | 29,110 | 35,900 |
| Portugal..... | 563 | 577 | 581 | 581 | 581 | 11.4 | 11.4 | 9.6 | 8.7 | 8.7 | 37,537 | 37,537 |
| Italy..... | 1,276 | 1,194 | 1,203 | 1,286 | 1,355 | 29.4 | 31.7 | 25.5 | 37.6 | 36.2 | 4,784 | 5,228 |
| Switzerland..... | 81 | 51 | 51 | 51 | 51 | 59.1 | 54.7 | 56.5 | 57.4 | 56.7 | 2,780 | 2,780 |
| Germany..... | 9,529 | 8,246 | 8,589 | 8,695 | 8,793 | 55.3 | 44.1 | 50.9 | 55.4 | 57.8 | 527,178 | 363,272 |
| Austria..... | 883 | 739 | 769 | 744 | 742 | 32.9 | 30.5 | 39.3 | 42.8 | 41.6 | 29,030 | 30,221 |
| Czechoslovakia..... | 2,506 | 2,044 | 2,070 | 2,074 | 2,150 | 38.4 | 40.1 | 42.2 | 47.3 | 43.8 | 96,147 | 82,029 |
| Hungary..... | 785 | 849 | 643 | 655 | 718 | 33.5 | 28.8 | 35.0 | 42.0 | 36.0 | 28,464 | 22,644 |
| Yugoslavia..... | 1,338 | 923 | 936 | 913 | 980 | 24.7 | 22.4 | 21.5 | 26.8 | 24.7 | 33,516 | 20,644 |
| Greece..... | 140 | 205 | 255 | 273 | 274 | 29.1 | 20.3 | 18.2 | 11.7 | 11.7 | 4,075 | 4,187 |
| Bulgaria..... | 408 | 362 | 379 | 326 | 274 | 21.2 | 19.6 | 19.8 | 21.0 | 30.9 | 8,651 | 7,100 |
| Rumania..... | 3,133 | 2,680 | 2,759 | 2,759 | 2,997 | 28.2 | 20.1 | 22.3 | 24.5 | 31.2 | 59,776 | 62,819 |
| Poland..... | 6,446 | 4,446 | 4,896 | 5,035 | 5,037 | 29.4 | 27.2 | 30.1 | 34.2 | 31.2 | 195,825 | 120,813 |
| Lithuania..... | 961 | 842 | 766 | 712 | 865 | 23.8 | 27.4 | 21.9 | 25.8 | 28.3 | 22,910 | 23,078 |
| Latvia..... | 785 | 740 | 736 | 736 | 747 | 25.1 | 24.6 | 16.6 | 17.0 | 31.7 | 19,188 | 18,205 |
| Estonia..... | 394 | 320 | 372 | 340 | 323 | 24.9 | 23.3 | 18.7 | 21.3 | 28.1 | 9,795 | 9,505 |
| Finland..... | 1,058 | 1,112 | 1,140 | 1,140 | 1,124 | 20.4 | 32.6 | 39.2 | 34.4 | 34.5 | 20,391 | 34,529 |
| Russia, European and Asiatic..... | 41,256 | 25,561 | 43,961 | 41,957 | 46,455 | 22.4 | 20.2 | 20.2 | 25.0 | 44.6 | 924,918 | 516,279 |
| Total Europe, reporting area and production all years..... | 47,848 | 42,688 | 42,634 | 42,966 | 43,927 | 39.1 | 35.8 | 39.3 | 42.3 | 44.6 | 1,869,068 | 1,529,933 |
| Estimated European total excluding Russia..... | 49,400 | 44,300 | 44,100 | 44,400 | 45,400 | | | | | | 1,931,000 | 1,584,000 |
| Total..... | | | | | | | | | | | 1,931,000 | 1,584,000 |

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| | | | | | | | | | | | | | |
|---|---------|---------|---------|---------|---------|------|------|------|------|-----------|-----------|-----------|-----------|
| AFRICA | | | | | | | | | | | | | |
| Morocco..... | 25 | 35 | 63 | 74 | 94 | 18.4 | 22.1 | 24.0 | 33.7 | (500) | 645 | 1,385 | 3,165 |
| Algeria..... | 449 | 605 | 535 | 601 | 619 | 21.0 | 19.8 | 24.1 | 23.5 | 13,489 | 12,713 | 10,606 | 4,520 |
| Tunis..... | 133 | 124 | 89 | 104 | 96 | 19.7 | 16.6 | 21.5 | 35.9 | 3,642 | 2,439 | 1,451 | 3,445 |
| Total..... | 607 | 764 | 687 | 779 | 809 | 20.7 | 19.6 | 23.8 | 26.1 | 17,631 | 15,797 | 13,482 | 21,130 |
| ASIA | | | | | | | | | | | | | |
| Turkey..... | 380 | 506 | 237 | | | 55.3 | | | | 21,562 | 11,391 | 4,078 | 718 |
| Syria and Lebanon..... | (12) | 296 | 65 | 26 | 28 | 16.7 | 18.7 | 18.9 | 25.6 | (175) | 1,435 | 1,215 | |
| Japan..... | 110 | 278 | 302 | 285 | | 39.0 | 41.0 | 40.4 | | 4,928 | 10,847 | 12,372 | |
| China..... | 141 | 276 | 272 | 265 | | 16.5 | 15.4 | 15.3 | | 2,202 | 4,545 | 4,178 | |
| Total Northern Hemisphere reporting area and production all years..... | 95,421 | 100,913 | 98,567 | 98,644 | 97,460 | 32.9 | 33.6 | 37.8 | 36.0 | 3,382,001 | 3,322,154 | 3,311,269 | 3,504,012 |
| Estimated Northern Hemisphere total excluding Russia and China..... | 97,700 | 103,300 | 100,900 | 100,900 | 99,800 | | | | | 3,474,000 | 3,405,000 | 3,398,000 | 3,595,000 |
| SOUTHERN HEMISPHERE | | | | | | | | | | | | | |
| Brazil..... | | 16 | 15 | | | | 29.8 | 24.0 | | | 452 | 447 | |
| Chile..... | 78 | 105 | 169 | 220 | | 37.7 | 37.8 | 24.0 | | 3,333 | 5,954 | 6,395 | 5,280 |
| Uruguay..... | 66 | 120 | 138 | 156 | 132 | 19.5 | 23.9 | 25.4 | 18.2 | 1,285 | 2,166 | 3,293 | 3,967 |
| Argentina..... | 2,396 | 2,692 | 3,160 | 3,608 | 3,734 | 22.6 | 22.3 | 16.5 | 18.1 | 54,246 | 59,286 | 52,290 | 65,173 |
| Union of South Africa..... | 809 | 640 | 565 | 630 | 639 | 11.9 | 10.5 | 12.1 | 17.0 | 9,661 | 6,093 | 5,952 | 7,568 |
| Australia..... | 745 | 1,000 | 1,122 | 1,054 | 775 | 23.8 | 19.0 | 15.5 | 16.2 | 17,768 | 19,010 | 15,105 | 17,081 |
| New Zealand..... | 396 | 125 | 88 | 73 | | 49.1 | 48.0 | 51.2 | | 17,978 | 5,996 | 4,695 | 3,736 |
| Total Northern and Southern Hemisphere countries reporting area and production all years..... | 98,692 | 104,335 | 102,430 | 103,088 | 101,965 | 34.9 | 32.5 | 36.9 | 35.2 | 3,447,193 | 3,389,699 | 3,372,804 | 3,806,026 |
| Estimated world total excluding Russia and China..... | 102,200 | 106,100 | 106,200 | 106,800 | 106,000 | | | | | 3,581,000 | 3,524,000 | 3,490,000 | 3,926,000 |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Figures given are for crops harvested during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

1 Where changes in boundary have occurred the averages are estimates for territory within present boundaries.
 2 1 year only.
 3 4-year average.
 4 The estimate for the 5-year period, 1909-1913, given in this table is somewhat larger than the figure obtained by averaging the same 5 years in Table 68. This is because in this table estimates for warring countries are for postwar boundaries, whereas in Table 68 they are for pre-war territory. As a result, in excluding Russia which lost territory in the war, a smaller area is excluded in this table than in Table 68.
 5 2-year average.

TABLE 68.—Oats: *World production, 1894-1929*

| Year | Estimated world production excluding Russia and China | Estimated European production excluding Russia | Selected countries | | | | | | | |
|-------------------|---|--|--------------------|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | United States | Russia ¹ | Germany | France | Canada | Poland | England and Wales | Argentina |
| | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels |
| 1894 | 2,303 | 1,451 | 716 | 744 | 453 | 294 | — | — | 119 | — |
| 1895 | 2,503 | 1,432 | 886 | 717 | 430 | 306 | — | — | 105 | — |
| 1896 | 2,320 | 1,376 | 780 | 800 | 411 | 286 | — | — | 93 | — |
| 1897 | 2,232 | 1,282 | 791 | 694 | 394 | 253 | — | — | 99 | 1 |
| 1898 | 2,501 | 1,511 | 843 | 688 | 405 | 322 | — | — | 102 | 1 |
| 1899 | 2,633 | 1,462 | 926 | 995 | 474 | 308 | — | — | 99 | 2 |
| 1900 | 2,624 | 1,454 | 914 | 854 | 489 | 285 | — | — | 99 | 2 |
| 1901 | 2,344 | 1,415 | 778 | 624 | 486 | 255 | — | — | 91 | 2 |
| 1902 | 2,888 | 1,576 | 1,053 | 931 | 514 | 320 | — | — | 115 | 4 |
| 1903 | 2,829 | 1,649 | 869 | 800 | 542 | 344 | — | — | 109 | 3 |
| 1904 | 2,716 | 1,455 | 1,009 | 1,124 | 478 | 291 | — | — | 112 | 4 |
| 1905 | 2,823 | 1,460 | 1,090 | 937 | 451 | 304 | — | — | 99 | 6 |
| 1906 | 3,673 | 1,683 | 1,036 | 714 | 581 | 297 | — | — | 109 | 12 |
| 1907 | 2,861 | 1,768 | 805 | 921 | 630 | 353 | — | — | 121 | 34 |
| 1908 | 2,832 | 1,632 | 851 | 959 | 530 | 327 | 250 | — | 106 | 32 |
| 1909 | 3,415 | 1,863 | 1,068 | 1,163 | 629 | 383 | 353 | — | 104 | 36 |
| 1910 | 3,223 | 1,660 | 1,186 | 1,065 | 544 | 332 | 214 | — | 104 | 47 |
| 1911 | 3,135 | 1,683 | 922 | 876 | 531 | 319 | 365 | — | 96 | 69 |
| 1912 | 3,700 | 1,720 | 1,418 | 1,089 | 587 | 355 | 392 | — | 89 | 73 |
| 1913 | 3,680 | 1,909 | 1,122 | 1,251 | 660 | 377 | 405 | — | 91 | 46 |
| 1914 | 3,266 | 1,681 | 1,141 | 1,915 | 628 | 318 | 313 | — | 93 | 40 |
| 1915 | 3,594 | 1,401 | 1,549 | 1,897 | 412 | 339 | 465 | — | 101 | 75 |
| 1916 | 3,259 | 1,469 | 1,252 | 1,845 | 484 | 277 | 410 | — | 102 | 32 |
| 1917 | 3,217 | 1,047 | 1,593 | 761 | 250 | 220 | 403 | — | 106 | 69 |
| 1918 | 3,216 | 1,117 | 1,538 | — | 302 | 181 | 426 | — | 141 | 34 |
| 1919 | 3,038 | 1,318 | 1,184 | — | 310 | 180 | 394 | 76 | 110 | 31 |
| 1920 | 3,645 | 1,476 | 1,496 | 486 | 332 | 291 | 541 | 129 | 103 | 51 |
| 1921 | 3,076 | 1,451 | 1,078 | 359 | 345 | 214 | 426 | 92 | 109 | 31 |
| 1922 | 3,310 | 1,471 | 1,216 | 400 | 277 | 285 | 491 | 110 | 88 | 56 |
| 1923 | 3,755 | 1,719 | 1,306 | 405 | 421 | 337 | 594 | 153 | 95 | 76 |
| 1924 | 3,623 | 1,570 | 1,503 | 603 | 390 | 306 | 406 | 106 | 105 | 53 |
| 1925 | 3,764 | 1,708 | 1,488 | 805 | 385 | 328 | 402 | 114 | 97 | 80 |
| 1926 | 3,621 | 1,815 | 1,247 | 1,040 | 436 | 364 | 383 | 134 | 101 | 66 |
| 1927 | 3,490 | 1,739 | 1,183 | 886 | 437 | 343 | 440 | 147 | 94 | 52 |
| 1928 | 3,926 | 1,881 | 1,439 | 1,092 | 482 | 340 | 452 | 172 | 101 | 65 |
| 1929 ² | — | 2,024 | 1,239 | — | 509 | 396 | 283 | 175 | 107 | 68 |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

¹ Includes all Russian territory reporting for the years shown.

² Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.

³ Exclusive of Russian Poland, Lithuania, parts of present Latvia and the Ukraine, and the provinces of Batum and Elizabetpol, in Transcaucasia.

⁴ Beginning this year estimates for the present territory of the Union of Socialist Soviet Republics exclusive of Turkestan, Transcaucasia, and the Far East, which territory in 1924 produced 20,243,000 bushels.

⁵ Beginning with this year postwar boundaries and therefore not comparable with earlier years.

⁶ Preliminary.

TABLE 69.—Oats: *Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917-1928*

| Year beginning July | Percentage of year's receipts | | | | | | | | | | | |
|---------------------|-------------------------------|------|-------|------|------|------|------|------|------|------|-----|------|
| | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June |
| 1917 | 4.7 | 16.4 | 13.5 | 11.1 | 7.7 | 7.8 | 8.3 | 8.0 | 7.1 | 6.5 | 4.0 | 4.9 |
| 1918 | 8.0 | 19.6 | 11.9 | 9.9 | 7.2 | 6.7 | 6.7 | 4.5 | 5.5 | 6.3 | 7.0 | 6.7 |
| 1919 | 14.4 | 18.4 | 10.1 | 9.2 | 5.8 | 8.3 | 8.2 | 6.6 | 4.9 | 4.3 | 5.2 | 4.6 |
| 1920 | 8.3 | 18.7 | 13.8 | 9.5 | 5.5 | 5.8 | 6.6 | 6.6 | 6.0 | 4.6 | 6.8 | 7.8 |
| 1921 | 15.1 | 16.5 | 11.8 | 7.9 | 5.3 | 6.1 | 7.3 | 6.9 | 5.6 | 4.3 | 7.2 | 6.0 |
| 1922 | 8.9 | 15.7 | 11.9 | 10.1 | 7.8 | 8.6 | 7.4 | 7.1 | 6.5 | 4.7 | 5.4 | 5.9 |
| 1923 | 7.0 | 17.7 | 14.1 | 11.5 | 6.8 | 7.6 | 7.7 | 7.9 | 5.2 | 4.8 | 4.8 | 4.9 |
| 1924 | 14.0 | 20.7 | 17.8 | 11.5 | 5.6 | 4.8 | 4.7 | 3.5 | 3.9 | 3.9 | 5.0 | 4.6 |
| 1925 | 10.4 | 22.2 | 13.2 | 9.3 | 6.8 | 6.8 | 6.1 | 6.2 | 5.2 | 4.2 | 4.5 | 5.6 |
| 1926 | 10.9 | 21.8 | 11.7 | 8.7 | 5.8 | 6.4 | 6.1 | 6.7 | 5.6 | 4.4 | 5.5 | 6.4 |
| 1927 | 9.3 | 22.7 | 13.8 | 9.7 | 5.7 | 6.7 | 6.3 | 6.3 | 6.2 | 3.8 | 4.1 | 5.4 |
| 1928 | 6.8 | 23.4 | 13.8 | 10.2 | 5.8 | 7.4 | 5.6 | 6.5 | 5.1 | 4.9 | 4.3 | 6.2 |

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TABLE 70.—Oats: Farm stocks, growing conditions, and shipments, United States, 1909-1929

| Year beginning August | Stocks of old oats on farms Aug. 1 ¹ | Conditions of new crop | | | | Weight per measured bushel of new oats ² | Stocks of oats on farms on Mar. 1 following ¹ | Shipped out of county where grown ¹ |
|-------------------------|---|------------------------|----------|----------|----------|---|--|--|
| | | June 1 | July 1 | Aug. 1 | Sept. 1 | | | |
| | 1,000 bush. | Per cent | Per cent | Per cent | Per cent | Pounds | 1,000 bush. | 1,000 bush. |
| 1909..... | 27, 478 | 88.7 | 88.3 | 85.5 | 83.8 | 32.7 | 365,795 | 345,908 |
| 1910..... | 66, 066 | 91.0 | 82.2 | 81.5 | 83.3 | 32.7 | 442,665 | 263,103 |
| 1911..... | 67, 801 | 85.7 | 68.8 | 65.7 | 64.5 | 31.1 | 289,989 | 295,944 |
| 1912..... | 34, 875 | 91.1 | 80.2 | 90.3 | 92.3 | 33.0 | 604,249 | 438,130 |
| 1913..... | 103, 016 | 87.0 | 70.3 | 73.8 | 74.0 | 32.1 | 419,481 | 297,395 |
| 1914..... | 62, 467 | 89.5 | 84.7 | 79.4 | 75.8 | 31.5 | 373,369 | 335,539 |
| 1915..... | 55, 607 | 92.2 | 83.9 | 91.6 | 91.1 | 33.0 | 698,148 | 465,823 |
| 1916..... | 113, 728 | 89.9 | 86.3 | 81.5 | 78.0 | 31.2 | 394,211 | 355,092 |
| 1917..... | 47, 834 | 88.8 | 89.4 | 87.2 | 90.4 | 33.4 | 599,208 | 514,117 |
| 1918..... | 81, 424 | 93.2 | 85.5 | 82.8 | 84.4 | 33.2 | 590,251 | 421,568 |
| 1919..... | 93, 045 | 93.2 | 87.0 | 76.5 | 73.0 | 31.1 | 469,730 | 312,304 |
| 1920..... | 54, 819 | 87.8 | 84.7 | 87.2 | 88.3 | 33.1 | 683,759 | 431,687 |
| 1921..... | 161, 108 | 85.7 | 77.6 | 64.5 | 61.1 | 28.3 | 411,034 | 258,259 |
| 1922..... | 74, 513 | 85.5 | 74.4 | 75.6 | 74.9 | 32.0 | 421,118 | 303,950 |
| 1923..... | 70, 965 | 85.6 | 83.5 | 81.9 | 80.3 | 32.1 | 447,366 | 322,971 |
| 1924..... | 65, 710 | 83.0 | 88.9 | 88.2 | 89.3 | 33.4 | 538,832 | 422,112 |
| 1925..... | 90, 179 | 79.6 | 76.3 | 79.1 | 82.1 | 32.9 | 571,218 | 364,407 |
| 1926..... | 107, 917 | 78.8 | 74.6 | 71.4 | 67.9 | 30.9 | 421,897 | 272,804 |
| 1927..... | 61, 237 | 70.9 | 70.9 | 74.8 | 70.3 | 30.4 | 373,167 | 229,058 |
| 1928..... | 42, 315 | 78.3 | 70.9 | 81.8 | 84.4 | 32.6 | 497,335 | 308,215 |
| 1929 ³ | 86, 816 | 82.0 | 79.0 | 75.6 | 71.6 | 31.8 | | |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Based on percentage of crop as reported by crop reporters.

² Average weight per measured bushel as reported by crop reporters.

³ Preliminary.

TABLE 71.—Oats: Receipts at primary markets, 1921-1928

| Year beginning August | Chicago | Milwaukee | Minneapolis | St. Louis | Peoria | Omaha | Total 10 markets ¹ |
|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1921..... | 78, 042 | 23, 612 | 33, 072 | 26, 118 | 13, 485 | 10, 961 | 215, 715 |
| 1922..... | 85, 169 | 22, 780 | 25, 706 | 33, 261 | 15, 917 | 11, 886 | 224, 104 |
| 1923..... | 69, 902 | 20, 406 | 29, 259 | 35, 791 | 13, 406 | 18, 345 | 219, 972 |
| 1924..... | 74, 698 | 20, 542 | 54, 886 | 34, 724 | 11, 164 | 10, 023 | 261, 562 |
| 1925..... | 50, 660 | 14, 165 | 36, 616 | 28, 662 | 9, 743 | 13, 124 | 207, 723 |
| 1926..... | 49, 420 | 14, 857 | 18, 170 | 19, 746 | 8, 256 | 6, 636 | 140, 031 |
| 1927..... | 53, 601 | 10, 506 | 27, 313 | 19, 394 | 8, 906 | 3, 858 | 155, 307 |
| 1928 ² | 40, 954 | 7, 634 | 20, 827 | 24, 427 | 7, 305 | 6, 842 | 133, 658 |

Bureau of Agricultural Economics. Compiled from reports of Chicago Board of Trade, Duluth Board of Trade, Indianapolis Board of Trade, Kansas City Board of Trade, Omaha Grain Exchange, St. Louis Merchants Exchange, Milwaukee Chamber of Commerce, Minneapolis Chamber of Commerce, and American Elevator and Grain Trade.

¹ Includes also Duluth, Toledo, Kansas City, and Indianapolis.

² Beginning January, 1929, figures are subject to revision.

TABLE 72.—Oats: Classification of receipts graded by licensed inspectors, all inspection plants, 1919-1928

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE

| Year and class | Receipts of— | | | | | Total |
|------------------------|--------------|---------|----------|---------|--------------|----------|
| | No. 1 | No. 2 | No. 3 | No. 4 | Sample grade | |
| Year beginning August— | Cars | Cars | Cars | Cars | Cars | Cars |
| 1919..... | 5, 652 | 51, 006 | 94, 497 | 15, 805 | 3, 537 | 170, 497 |
| 1920..... | 8, 808 | 60, 160 | 73, 072 | 14, 766 | 6, 831 | 163, 641 |
| 1921..... | 2, 519 | 31, 613 | 105, 103 | 31, 774 | 6, 694 | 177, 703 |
| 1922..... | 2, 518 | 47, 348 | 95, 984 | 17, 004 | 4, 640 | 167, 524 |
| 1923..... | 2, 724 | 41, 530 | 90, 759 | 22, 643 | 11, 307 | 168, 963 |
| 1924..... | 1, 489 | 33, 631 | 110, 377 | 24, 580 | 14, 853 | 184, 910 |
| 1925..... | 2, 197 | 53, 587 | 75, 634 | 17, 989 | 6, 260 | 155, 667 |
| 1926..... | 1, 465 | 19, 692 | 49, 581 | 28, 548 | 17, 695 | 116, 981 |
| 1927..... | 2, 838 | 29, 106 | 64, 444 | 19, 397 | 5, 728 | 121, 513 |
| 1928..... | 4, 408 | 14, 144 | 77, 823 | 20, 684 | 9, 305 | 126, 364 |

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TABLE 73.—Oats: Visible supply in United States,¹ 1909–1929

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1909..... | 3,800 | 5,183 | 12,799 | 13,264 | 13,586 | 11,180 | 8,759 | 8,639 | 9,918 | 9,223 | 6,905 | 4,245 |
| 1910..... | 2,761 | 12,651 | 18,802 | 17,022 | 15,505 | 16,129 | 15,997 | 15,769 | 13,129 | 10,559 | 8,125 | 9,570 |
| 1911..... | 11,203 | 20,742 | 21,044 | 22,600 | 20,315 | 18,754 | 15,431 | 14,366 | 13,429 | 11,991 | 8,052 | 3,690 |
| 1912..... | 1,031 | 4,160 | 9,260 | 10,552 | 10,774 | 8,457 | 9,646 | 12,343 | 13,115 | 8,704 | 8,105 | 14,756 |
| 1913..... | 17,131 | 24,662 | 30,718 | 31,684 | 29,664 | 26,909 | 24,450 | 21,489 | 19,755 | 13,262 | 8,144 | 7,210 |
| 1914..... | 6,482 | 20,124 | 27,285 | 31,866 | 32,471 | 32,956 | 33,173 | 33,258 | 27,284 | 23,022 | 12,623 | 4,345 |
| 1915..... | 1,309 | 2,924 | 14,381 | 15,730 | 20,928 | 21,081 | 20,175 | 20,265 | 17,892 | 12,096 | 10,192 | 12,452 |
| 1916..... | 8,537 | 27,691 | 38,866 | 45,580 | 47,487 | 48,823 | 42,675 | 36,740 | 34,191 | 28,933 | 17,454 | 9,741 |
| 1917..... | 6,679 | 7,277 | 14,165 | 17,453 | 18,595 | 17,657 | 13,879 | 13,947 | 18,068 | 21,911 | 20,822 | 13,227 |
| 1918..... | 7,876 | 19,309 | 24,689 | 22,050 | 20,143 | 34,828 | 30,505 | 27,666 | 22,882 | 21,507 | 15,827 | 18,094 |
| 1919..... | 20,481 | 19,411 | 19,552 | 19,196 | 16,922 | 13,080 | 11,550 | 10,401 | 9,576 | 6,813 | 8,642 | 3,623 |
| 1920..... | 3,786 | 8,149 | 27,602 | 34,414 | 33,961 | 32,194 | 33,632 | 34,142 | 33,903 | 30,740 | 28,426 | 34,401 |
| 1921..... | 37,582 | 60,455 | 65,843 | 69,998 | 69,198 | 67,728 | 68,010 | 68,529 | 64,644 | 55,837 | 47,950 | 42,743 |
| 1922..... | 36,667 | 38,355 | 35,968 | 34,077 | 32,940 | 32,391 | 30,861 | 27,683 | 24,044 | 21,932 | 13,514 | 8,523 |
| 1923..... | 5,477 | 10,111 | 16,514 | 20,488 | 18,686 | 19,940 | 17,539 | 17,741 | 16,715 | 10,656 | 6,720 | 6,264 |
| 1924..... | 3,086 | 11,403 | 52,715 | 66,564 | 67,265 | 72,128 | 73,570 | 72,386 | 61,104 | 48,082 | 35,331 | 33,263 |
| 1925..... | 26,298 | 50,706 | 65,818 | 64,926 | 64,251 | 63,187 | 63,076 | 58,974 | 52,023 | 47,025 | 38,976 | 37,900 |
| 1926..... | 33,772 | 43,671 | 48,450 | 48,097 | 48,288 | 44,927 | 45,422 | 43,454 | 37,145 | 29,573 | 20,502 | 17,790 |
| 1927..... | 12,001 | 21,501 | 24,931 | 23,857 | 23,252 | 21,907 | 20,350 | 19,791 | 15,746 | 11,168 | 7,086 | 3,225 |
| 1928..... | 2,377 | 13,376 | 15,193 | 14,472 | 13,295 | 13,968 | 13,611 | 14,896 | 12,609 | 10,276 | 9,280 | 7,430 |
| 1929..... | 7,626 | 23,488 | 26,321 | 30,155 | 27,534 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from the Chicago Daily Trade Bulletin.

¹ Saturday nearest the 1st of each month.

TABLE 74. Oats: Commercial stocks in store, 1926–27 to 1929–30

DOMESTIC OATS IN UNITED STATES¹

| | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1926–27..... | ----- | ----- | ----- | ----- | ----- | 47,123 | 47,421 | 45,105 | 38,481 | 30,513 | 22,553 | 17,686 |
| 1927–28..... | 11,886 | 23,224 | 26,513 | 25,682 | 24,784 | 23,815 | 20,006 | 21,127 | 16,803 | 11,667 | 7,171 | 3,338 |
| 1928–29..... | 1,939 | 15,992 | 17,561 | 16,900 | 15,399 | 17,314 | 16,219 | 16,800 | 14,003 | 11,493 | 10,591 | 8,592 |
| 1929–30..... | 8,668 | 24,318 | 28,597 | 32,762 | 30,064 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

UNITED STATES OATS IN CANADA

| | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 1,253 | 1,238 | 1,435 | 1,110 | 825 | 670 | 563 | 438 | 216 | 57 | 239 | 60 |
| 1927–28..... | 4 | 978 | 2,326 | 1,031 | 547 | 644 | 494 | 424 | 309 | 716 | 529 | 346 |
| 1928–29..... | 334 | 2,177 | 4,711 | 4,435 | 4,410 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 1929–30..... | ----- | ----- | ----- | ----- | ----- | 352 | 247 | 218 | 164 | 635 | 1,432 | 1,759 |

CANADIAN OATS IN UNITED STATES¹

| | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 24 | 26 | 0 | 139 | 296 | 609 | 312 | 247 | 117 | 21 | 199 | 122 |
| 1927–28..... | 101 | 123 | 141 | 211 | 711 | 900 | 704 | 801 | 516 | 722 | 577 | 377 |
| 1928–29..... | 341 | 341 | 283 | 426 | 670 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 1929–30..... | ----- | ----- | ----- | ----- | ----- | 228 | 228 | 171 | 66 | 117 | 321 | 19 |

Bureau of Agricultural Economics. Compiled from weekly reports to the Grain, Hay, and Feed Market News Service. Data are for stocks on the Saturday nearest the 1st day of the month.

¹ Includes oats in store in public and private elevators in 39 important markets and also the oats afloat in vessels or barges in the harbors of lake and seaboard ports. Oats in transit either by rail or water, mill stocks, or small private stocks of oats intended only for local purposes, not included.² Includes oats stored at lake and seaboard ports, exclusive of oats in transit on lakes and canals.

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TABLE 75.—Oats, including oatmeal: International trade, average 1910-1914, annual 1926-1929

| Country | Year ended June 30 | | | | | | | | | |
|--------------------------------------|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|---------------|
| | Average 1910-1914 | | 1926 | | 1927 | | 1928 | | 1929 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | | | | | | | | | | |
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Argentina..... | 1 55 | 1 42, 569 | 92 | 32, 006 | 102 | 39, 691 | 80 | 28, 831 | --- | --- |
| Canada..... | 84 | 15, 245 | 2, 246 | 35, 951 | 2, 051 | 13, 381 | 2, 770 | 10, 194 | 3, 452 | 19, 927 |
| United States..... | 5, 352 | 9, 655 | 185 | 39, 686 | 99 | 15, 041 | 202 | 9, 823 | 398 | 16, 302 |
| Rumania..... | 2 3 72 | 2 10, 493 | 1 | 1, 352 | 0 | 6, 634 | --- | --- | --- | --- |
| Russia..... | 1 1, 206 | 2 70, 466 | 0 | 1, 354 | 0 | --- | --- | --- | --- | --- |
| Algeria..... | 2 79 | 2 4, 102 | 68 | 2, 595 | 1, 560 | 102 | 498 | 1, 565 | --- | --- |
| Chile..... | 1 2 | 2 2, 469 | 0 | 4, 093 | 0 | 6, 087 | 0 | 4, 021 | --- | --- |
| Czechoslovakia..... | 0 | 0 | 4, 747 | 44 | 323 | 3, 595 | 530 | 5, 862 | 300 | 4, 453 |
| Hungary..... | 1 1, 420 | 2 12, 416 | 7 | 3, 606 | 0 | 2, 381 | 1 | 1, 199 | 1 | 790 |
| Irish Free State..... | 0 | 0 | 2, 862 | 3, 485 | 1, 824 | 2, 756 | 560 | 5, 740 | 1, 043 | 2, 335 |
| Tunis..... | 2 2 | 2 2, 875 | 28 | 1, 462 | 92 | 1, 047 | 283 | 414 | --- | --- |
| Yugoslavia..... | 0 | 0 | 0 | 962 | 0 | 666 | 25 | 493 | 71 | 325 |
| Australia..... | 1 898 | 1 270 | 343 | 133 | 260 | 205 | --- | --- | --- | --- |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 68, 371 | 1 1, 591 | 36, 897 | 1, 136 | 24, 911 | 2, 024 | 31, 309 | 713 | 26, 003 | 1, 020 |
| Germany..... | 37, 202 | 33, 575 | 28, 204 | 5, 334 | 19, 255 | 7, 923 | 16, 522 | 13, 311 | 9, 961 | 25, 835 |
| Switzerland..... | 12, 464 | 2 13 | 10, 662 | 4 | 9, 895 | 4 | 9, 770 | 4 | 10, 741 | 5 |
| Belgium..... | 8, 420 | 62 | 9, 618 | 25 | 6, 576 | 120 | 6, 607 | 30 | 9, 354 | 15 |
| France..... | 29, 846 | 122 | 14, 110 | 388 | 3, 309 | 488 | 2, 489 | 1, 735 | 7, 276 | 394 |
| Italy..... | 8, 158 | 65 | 7, 743 | 42 | 7, 723 | 0 | 9, 064 | 1 | 5, 429 | 1 |
| Netherlands..... | 38, 862 | 2 30, 771 | 7, 477 | 287 | 6, 452 | 167 | 6, 938 | 260 | 6, 486 | 773 |
| Austria..... | 2 2, 295 | 2 114 | 4, 877 | 11 | 5, 819 | 12 | 5, 303 | 12 | --- | --- |
| Sweden..... | 2 6, 468 | 2 1, 899 | 2, 908 | 329 | 1, 631 | 2, 429 | 2, 215 | 536 | 4, 172 | 720 |
| Finland..... | 1 1, 150 | 2 356 | 1, 528 | 17 | 1, 279 | 4 | 990 | 92 | 3, 503 | 13 |
| Poland..... | 0 | 0 | 1, 283 | 5, 926 | 2, 870 | 1, 048 | 1, 619 | 659 | 1, 461 | 267 |
| Denmark..... | 2 4, 720 | 2 152 | 842 | 411 | 1, 922 | 164 | 2, 155 | 123 | 2, 615 | 326 |
| Norway..... | 2 497 | 2 27 | 1, 413 | 11 | 582 | 6 | 683 | 5 | 336 | 9 |
| Cuba..... | 1, 291 | 0 | 1, 502 | 0 | 1, 321 | 0 | 1, 051 | 0 | 1, 318 | 0 |
| Estonia..... | 0 | 0 | 669 | 0 | 354 | 0 | 622 | 0 | --- | --- |
| Latvia..... | 0 | 0 | 513 | 27 | 705 | 0 | 7 | 0 | --- | --- |
| Japan..... | 5 | 42 | 153 | 0 | 144 | 0 | 200 | 0 | 107 | 0 |
| Greece..... | 0 | 0 | --- | 0 | 423 | 0 | --- | --- | --- | --- |
| Union of South Africa..... | 1 366 | 1 434 | 231 | 125 | 191 | 69 | 126 | 78 | --- | --- |
| Total, 32 countries..... | 229, 285 | 239, 783 | 141, 210 | 141, 002 | 101, 673 | 106, 050 | 102, 619 | 85, 701 | 94, 027 | 73, 510 |

Bureau of Agricultural Economics. Official sources except where otherwise noted.

1 Average of calendar years, 1909-1913 from original source.

2 Year ended July 31, International Yearbook of Agricultural Statistics.

3 Average for the season 1911-12 to 1913-14.

4 International Crop Report and Agricultural Statistics.

5 Year ended Dec. 31.

6 Average for calendar years 1909-1913. International Yearbook of Agricultural Statistics.

7 Season 1913-14.

TABLE 76.—Oats: Estimated average price per bushel, received by producers, United States, 1909-1929

| Year beginning August | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Weighted average |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909 | 46.2 | 41.6 | 41.0 | 40.6 | 41.5 | 43.9 | 45.5 | 45.8 | 44.4 | 43.2 | 42.6 | 41.9 | 43.2 |
| 1910 | 40.0 | 37.3 | 35.6 | 34.6 | 33.8 | 33.2 | 33.0 | 32.6 | 32.8 | 34.0 | 36.1 | 38.8 | 36.2 |
| 1911 | 40.3 | 41.4 | 43.2 | 44.4 | 45.0 | 46.3 | 48.6 | 50.9 | 54.0 | 55.6 | 53.9 | 48.4 | 46.1 |
| 1912 | 39.6 | 34.3 | 33.6 | 32.8 | 32.0 | 32.3 | 32.8 | 33.1 | 33.6 | 35.1 | 36.8 | 37.6 | 34.9 |
| 1913 | 38.4 | 39.4 | 38.8 | 38.6 | 39.2 | 39.2 | 39.1 | 39.2 | 39.5 | 39.8 | 39.4 | 37.8 | 38.9 |
| 1914 | 39.5 | 42.8 | 43.1 | 43.4 | 44.4 | 47.6 | 51.1 | 52.8 | 53.4 | 52.4 | 49.0 | 46.0 | 44.9 |
| 1915 | 42.0 | 36.5 | 34.7 | 35.5 | 37.6 | 41.8 | 43.6 | 42.4 | 42.3 | 42.4 | 41.2 | 40.2 | 39.3 |
| 1916 | 41.6 | 43.8 | 46.8 | 50.7 | 51.9 | 53.3 | 56.0 | 59.2 | 66.2 | 70.4 | 69.4 | 71.3 | 51.4 |
| 1917 | 67.7 | 62.0 | 62.0 | 64.2 | 70.2 | 76.3 | 82.4 | 87.6 | 87.4 | 82.0 | 77.2 | 74.6 | 72.1 |
| 1918 | 71.6 | 70.6 | 69.6 | 69.6 | 70.8 | 67.6 | 63.4 | 64.2 | 68.4 | 71.0 | 71.0 | 73.1 | 70.1 |
| 1919 | 73.5 | 70.0 | 68.6 | 69.6 | 74.3 | 80.4 | 83.6 | 87.6 | 94.5 | 100.6 | 103.7 | 93.2 | 80.3 |
| 1920 | 76.0 | 65.4 | 57.6 | 50.2 | 45.8 | 43.7 | 41.8 | 40.6 | 38.0 | 37.4 | 36.8 | 34.7 | 51.1 |
| 1921 | 32.0 | 30.6 | 30.1 | 29.7 | 30.6 | 31.9 | 34.7 | 36.6 | 37.2 | 38.2 | 37.8 | 36.2 | 33.4 |
| 1922 | 33.6 | 33.4 | 36.4 | 38.8 | 40.3 | 41.5 | 42.4 | 43.5 | 44.8 | 45.3 | 43.7 | 40.2 | 39.0 |
| 1923 | 37.6 | 38.0 | 39.4 | 40.8 | 42.6 | 43.4 | 45.4 | 46.2 | 46.5 | 46.3 | 46.8 | 49.4 | 42.6 |
| 1924 | 49.1 | 47.1 | 48.9 | 47.4 | 50.6 | 54.0 | 53.4 | 49.7 | 44.7 | 45.4 | 48.3 | 45.3 | 48.3 |
| 1925 | 40.7 | 38.1 | 37.2 | 37.6 | 39.1 | 40.0 | 39.2 | 38.8 | 39.4 | 39.5 | 38.9 | 37.7 | 39.0 |
| 1926 | 37.9 | 35.6 | 39.0 | 39.8 | 41.1 | 42.6 | 43.4 | 43.4 | 43.2 | 45.4 | 48.0 | 46.3 | 41.2 |
| 1927 | 44.4 | 43.9 | 44.6 | 45.1 | 48.1 | 49.3 | 51.3 | 54.5 | 56.9 | 62.0 | 61.4 | 56.2 | 48.9 |
| 1928 | 38.4 | 36.7 | 39.0 | 39.8 | 42.5 | 43.7 | 47.0 | 46.6 | 45.8 | 44.6 | 42.5 | 42.9 | 41.6 |
| 1929 | 42.7 | 44.1 | 44.8 | 43.1 | 43.6 | ----- | ----- | ----- | 45.8 | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of oats for each State; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, August, 1909-December, 1923.

TABLE 77.—Oats, No. 3, white: Weighted average price¹ per bushel of reported cash sales, Chicago, 1909-1929

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Weighted average ¹ |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909 | 38 | 39 | 40 | 40 | 44 | 48 | 47 | 44 | 42 | 40 | 38 | 41 | 42 |
| 1910 | 35 | 34 | 32 | 32 | 32 | 33 | 31 | 31 | 32 | 31 | 39 | 44 | 33 |
| 1911 | 41 | 45 | 47 | 48 | 47 | 50 | 52 | 53 | 57 | 55 | 53 | 49 | 50 |
| 1912 | 33 | 33 | 33 | 32 | 33 | 33 | 33 | 32 | 35 | 38 | 40 | 40 | 35 |
| 1913 | 42 | 43 | 40 | 40 | 40 | 39 | 39 | 39 | 39 | 40 | 40 | 37 | 40 |
| 1914 | 42 | 48 | 46 | 48 | 49 | 53 | 58 | 57 | 57 | 51 | 49 | 53 | 50 |
| 1915 | 41 | 34 | 36 | 36 | 42 | 48 | 45 | 42 | 44 | 43 | 39 | 41 | 41 |
| 1916 | 44 | 46 | 49 | 55 | 53 | 57 | 56 | 61 | 69 | 70 | 67 | 78 | 54 |
| 1917 | 61 | 60 | 60 | 65 | 77 | 82 | 89 | 93 | 89 | 77 | 77 | 77 | 71 |
| 1918 | 70 | 72 | 69 | 72 | 72 | 65 | 58 | 63 | 70 | 69 | 70 | 78 | 70 |
| 1919 | 73 | 68 | 70 | 73 | 82 | 86 | 86 | 93 | 101 | 109 | 113 | 91 | 80 |
| 1920 | 70 | 62 | 54 | 51 | 48 | 44 | 42 | 42 | 36 | 39 | 37 | 34 | 51 |
| 1921 | 32 | 35 | 31 | 33 | 34 | 34 | 39 | 36 | 38 | 38 | 37 | 36 | 35 |
| 1922 | 32 | 38 | 42 | 43 | 44 | 43 | 44 | 45 | 46 | 45 | 43 | 40 | 41 |
| 1923 | 38 | 40 | 43 | 43 | 44 | 46 | 48 | 47 | 48 | 48 | 51 | 54 | 45 |
| 1924 | 50 | 48 | 50 | 50 | 58 | 58 | 53 | 48 | 42 | 45 | 49 | 44 | 50 |
| 1925 | 41 | 39 | 39 | 40 | 42 | 42 | 41 | 40 | 42 | 41 | 40 | 42 | 41 |
| 1926 | 38 | 38 | 44 | 42 | 46 | 46 | 43 | 44 | 45 | 50 | 49 | 45 | 43 |
| 1927 | 47 | 47 | 48 | 49 | 54 | 55 | 56 | 59 | 63 | 67 | 68 | 56 | 55 |
| 1928 | 38 | 41 | 42 | 41 | 46 | 50 | 50 | 48 | 48 | 45 | 45 | 47 | 44 |
| 1929 | 43 | 48 | 47 | 45 | 45 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from the Chicago Daily Trade Bulletin. Data for 1899-1908 available in 1924 Yearbook, p. 628, Table 94.

¹ A average of daily prices weighted by car-lot sales.

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TABLE 78.—*Barley: Acreage, production, value, exports, etc., United States, 1900–1929*

| Year | Acreage harvested | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Price per bushel at Chicago, year beginning August ¹ | Foreign trade, including barley, flour, and malt, year beginning July 1 ² | | | |
|-------------------------|-------------------|------------------------|---------------|---|-------------------|---|--|---------------|--------------------------|--------------------------|
| | | | | | | | Domestic exports | Imports | Net exports ³ | |
| | | | | | | | | | Total | Percentage of production |
| | 1,000 acres | Bushels of 48 lbs. | 1,000 bushels | Cents | 1,000 dollars | Cents | 1,000 bushels | 1,000 bushels | 1,000 bushels | Per cent |
| 1900..... | 4,545 | 21.1 | 96,041 | 40.5 | 38,896 | 4.56 | 6,919 | 175 | 6,445 | 6.7 |
| 1901..... | 4,742 | 25.7 | 121,761 | 45.2 | 55,068 | 61 | 9,079 | 60 | 9,019 | 7.4 |
| 1902..... | 5,126 | 29.1 | 149,389 | 45.5 | 67,944 | 55 | 8,745 | 59 | 8,686 | 5.8 |
| 1903..... | 5,558 | 26.4 | 146,864 | 45.4 | 66,700 | 56 | 11,280 | 91 | 11,187 | 7.6 |
| 1904..... | 5,912 | 27.4 | 162,105 | 41.0 | 67,427 | 49 | 11,105 | 84 | 11,021 | 6.8 |
| 1905..... | 6,250 | 27.2 | 170,089 | 39.4 | 66,559 | 50 | 18,131 | 20 | 18,410 | 10.8 |
| 1906..... | 6,730 | 28.6 | 192,270 | 41.6 | 80,069 | 61 | 8,616 | 41 | 8,632 | 4.5 |
| 1907..... | 6,911 | 24.5 | 170,008 | 66.3 | 112,675 | 84 | 4,554 | 202 | 4,370 | 2.6 |
| 1908..... | 7,234 | 25.3 | 184,857 | 55.2 | 102,037 | 67 | 6,729 | 4 | 6,725 | 3.6 |
| 1909..... | 7,699 | 22.5 | 173,344 | 77.3 | 134,844 | 100 | — | — | — | — |
| 1910..... | 7,699 | 24.4 | 187,973 | 54.8 | 102,917 | 67 | 4,454 | 5 | 4,449 | 2.4 |
| 1911..... | 7,733 | 22.5 | 173,892 | 57.8 | 100,426 | 92 | 9,507 | 187 | 9,320 | 5.4 |
| 1912..... | 7,627 | 21.0 | 160,240 | 86.9 | 139,182 | 122 | 1,655 | 2,772 | 1,117 | .7 |
| 1913..... | 7,530 | 29.7 | 223,824 | 50.5 | 112,957 | 68 | 17,874 | 15 | 17,859 | 8.0 |
| 1914..... | 7,499 | 23.8 | 178,180 | 53.7 | 95,731 | 65 | 6,945 | 351 | 6,594 | 3.7 |
| 1915..... | 7,565 | 25.8 | 191,953 | 54.3 | 105,903 | 72 | 28,712 | 103 | 28,609 | 11.7 |
| 1916..... | 7,148 | 32.0 | 228,851 | 51.6 | 118,172 | 69 | 30,821 | 37 | 30,783 | 13.5 |
| 1917..... | 7,757 | 23.5 | 182,309 | 88.1 | 160,646 | 191 | 20,319 | 162 | 19,857 | 10.9 |
| 1918..... | 8,933 | 23.7 | 211,759 | 113.7 | 240,758 | 146 | 28,717 | 517 | 28,200 | 13.3 |
| 1919..... | 9,719 | 26.3 | 256,225 | 91.7 | 234,942 | 104 | 29,324 | 24 | 29,301 | 11.4 |
| 1920..... | 6,473 | 18.0 | 122,075 | — | — | — | — | — | — | — |
| 1921..... | 6,720 | 22.0 | 147,608 | 120.6 | 178,080 | 115 | 31,691 | 335 | 34,356 | 23.3 |
| 1922..... | 7,600 | 24.9 | 189,332 | 71.3 | 135,083 | 78 | 27,255 | 20 | 27,234 | 11.4 |
| 1923..... | 7,414 | 20.9 | 151,946 | 41.9 | 64,934 | 61 | 27,546 | 8 | 27,538 | 17.8 |
| 1924..... | 7,317 | 24.9 | 182,068 | 52.5 | 95,560 | 65 | 21,909 | 38 | 21,871 | 12.0 |
| 1925..... | 7,835 | 25.2 | 197,601 | 54.1 | 107,038 | 72 | 13,913 | 55 | 13,858 | 7.0 |
| 1926..... | 6,767 | 25.5 | 159,189 | — | — | — | — | — | — | — |
| 1927..... | 6,925 | 26.2 | 181,575 | 74.1 | 134,590 | 90 | 28,542 | 48 | 28,495 | 15.7 |
| 1928..... | 7,997 | 26.7 | 213,863 | 58.8 | 125,709 | 72 | 30,448 | 53 | 30,395 | 14.2 |
| 1929..... | 7,970 | 23.2 | 184,905 | 57.5 | 106,237 | 77 | 19,655 | 49 | 19,605 | 10.6 |
| 1927..... | 9,476 | 28.1 | 265,882 | 67.8 | 180,200 | 91 | 39,271 | 45 | 39,230 | 14.8 |
| 1928..... | 12,598 | 28.4 | 357,487 | 55.2 | 197,450 | 60 | 60,295 | 45 | 60,210 | 16.9 |
| 1929 ⁴ | 13,212 | 23.2 | 307,105 | 55.0 | 168,807 | — | — | — | — | — |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns. See 1927 Yearbook, page 799, for data for earlier years.

¹ From Bureau of Labor Statistics as follows: Bulletin No. 39, 1900–1901. August, 1900–December, 1901, choice to fancy malting, by samples. Wholesale price bulletins—monthly quotations, January, 1902–December, 1913, choice to fancy malting; January, 1914–September, 1927, fair to good malting. Beginning October, 1927, grade reported as feeding, but as grade remained unchanged, no change was made in comparative prices.

² Compiled from Commerce and Navigation of the United States 1900–1917: Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues; 1919–1926; January and June issues, 1927–1929, and official records of the Bureau of Foreign and Domestic Commerce. Malt converted to terms of barley on the basis that 1.1 bushels of malt is the product of 1 bushel of barley. Barley flour converted on the basis that 1 barrel of flour is the product of 9 bushels of barley. Exports of flour not reported prior to 1919. Barley—general imports, 1900–1909; imports for consumption, 1910–1929. Malt—general imports, 1900–1914; imports for consumption, 1915–1929. Imports of flour not reported prior to 1915; imports for consumption, 1915–1929.

³ Total exports (domestic exports plus reexports) minus total imports.

⁴ Average for 11 months.

⁵ Net imports. Total imports minus total exports (domestic plus foreign).

⁶ Preliminary.

TABLE 79.—*Barley: Acreage harvested and production, by States, average 1923-1927, annual 1926-1929*

| State and division | Acreage harvested | | | | | Production | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ¹ | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| Maine..... | 4 | 4 | 4 | 4 | 4 | 106 | 120 | 108 | 112 | 124 |
| Vermont..... | 6 | 6 | 6 | 6 | 7 | 192 | 180 | 174 | 150 | 210 |
| New York..... | 170 | 179 | 188 | 160 | 159 | 4,859 | 5,066 | 5,452 | 4,648 | 3,514 |
| New Jersey..... | ² 1 | 1 | 2 | 2 | 3 | ² 41 | 33 | 74 | 60 | 66 |
| Pennsylvania..... | 15 | 18 | 21 | 20 | 36 | 404 | 486 | 588 | 783 | 882 |
| North Atlantic.. | 196 | 208 | 221 | 210 | 209 | 5,599 | 5,885 | 6,396 | 5,753 | 4,706 |
| Ohio..... | 102 | 116 | 155 | 333 | 103 | 2,969 | 3,712 | 4,185 | 9,191 | 2,420 |
| Indiana..... | 28 | 23 | 35 | 78 | 31 | 663 | 575 | 833 | 1,794 | 682 |
| Illinois..... | 292 | 302 | 453 | 680 | 456 | 8,958 | 9,362 | 13,364 | 20,060 | 12,084 |
| Michigan..... | 143 | 133 | 186 | 270 | 243 | 3,844 | 3,790 | 5,301 | 8,100 | 5,589 |
| Wisconsin..... | 492 | 521 | 620 | 725 | 703 | 16,419 | 17,974 | 21,390 | 26,898 | 22,848 |
| Minnesota..... | 1,148 | 1,307 | 1,460 | 2,000 | 2,200 | 32,549 | 32,675 | 43,800 | 60,000 | 59,400 |
| Iowa..... | 238 | 268 | 454 | 802 | 642 | 7,325 | 8,174 | 14,256 | 26,466 | 19,581 |
| Missouri..... | 6 | 9 | 7 | 13 | 14 | 165 | 216 | 161 | 286 | 238 |
| North Dakota..... | 1,517 | 1,472 | 1,663 | 2,179 | 2,550 | 32,494 | 21,050 | 42,406 | 55,564 | 36,210 |
| South Dakota..... | 915 | 778 | 1,200 | 1,680 | 2,016 | 21,801 | 7,858 | 36,000 | 36,450 | 37,296 |
| Nebraska..... | 259 | 227 | 246 | 430 | 647 | 6,741 | 4,699 | 7,577 | 14,018 | 18,892 |
| Kansas..... | 494 | 266 | 452 | 633 | 608 | 8,539 | 3,032 | 5,095 | 17,061 | 12,464 |
| North Central.. | 5,633 | 5,422 | 6,931 | 9,823 | 10,213 | 142,466 | 113,117 | 194,968 | 276,494 | 227,704 |
| Maryland..... | 9 | 10 | 9 | 13 | 16 | 304 | 343 | 274 | 416 | 512 |
| Virginia..... | 14 | 14 | 13 | 14 | 18 | 373 | 434 | 338 | 406 | 504 |
| North Carolina..... | ² 13 | 15 | 20 | 32 | 40 | ² 315 | 390 | 480 | 736 | 960 |
| South Atlantic.. | 33 | 39 | 42 | 59 | 74 | 931 | 1,167 | 1,092 | 1,558 | 1,976 |
| Kentucky..... | 6 | 7 | 6 | 2 | 7 | 172 | 231 | 162 | 50 | 206 |
| Tennessee..... | 28 | 40 | 42 | 21 | 24 | 659 | 1,200 | 798 | 420 | 480 |
| Oklahoma..... | 122 | 110 | 36 | 54 | 57 | 2,595 | 2,970 | 594 | 1,188 | 1,425 |
| Texas..... | 152 | 174 | 195 | 156 | 203 | 3,357 | 6,090 | 3,120 | 3,276 | 5,075 |
| South Central.. | 308 | 331 | 279 | 233 | 291 | 6,783 | 10,491 | 4,074 | 4,934 | 7,186 |
| Montana..... | 137 | 150 | 195 | 209 | 251 | 3,609 | 3,600 | 6,435 | 6,374 | 4,016 |
| Idaho..... | 115 | 112 | 129 | 144 | 147 | 4,587 | 4,144 | 5,676 | 6,192 | 5,733 |
| Wyoming..... | 38 | 42 | 59 | 95 | 124 | 1,216 | 1,386 | 2,006 | 2,660 | 3,348 |
| Colorado..... | 365 | 380 | 410 | 547 | 651 | 7,790 | 6,080 | 9,020 | 13,128 | 13,671 |
| New Mexico..... | 8 | 8 | 8 | 12 | 13 | 147 | 208 | 144 | 228 | 325 |
| Arizona..... | 24 | 25 | 20 | 17 | 18 | 827 | 875 | 700 | 646 | 630 |
| Utah..... | 21 | 20 | 30 | 34 | 39 | 855 | 800 | 1,410 | 1,666 | 1,560 |
| Nevada..... | 7 | 7 | 9 | 11 | 11 | 287 | 280 | 405 | 385 | 363 |
| Washington..... | 74 | 64 | 58 | 55 | 63 | 2,634 | 2,176 | 2,436 | 1,952 | 2,142 |
| Oregon..... | 84 | 82 | 91 | 105 | 116 | 2,632 | 2,296 | 3,185 | 3,675 | 4,292 |
| California..... | 997 | 1,080 | 994 | 1,044 | 992 | 28,422 | 32,400 | 27,335 | 31,842 | 29,363 |
| Far Western... | 1,869 | 1,970 | 2,003 | 2,273 | 2,425 | 53,005 | 54,245 | 58,752 | 68,748 | 65,443 |
| United States.. | 8,041 | 7,970 | 9,476 | 12,598 | 13,212 | 208,783 | 184,905 | 265,882 | 357,487 | 307,105 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.² 4-year average.

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TABLE 80.—*Barley: Yield per acre and estimated price per bushel, December 1, by States, averages, and annual 1924-1929*

| State and division | Yield per acre | | | | | | | Estimated price per bushel | | | | | | |
|---------------------|--------------------|-------|-------|-------|-------|-------|-------|----------------------------|-------|------|------|------|-------|-------|
| | Average, 1918-1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Average, 1923-1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| Maine..... | 28.1 | 26.0 | 35.0 | 30.0 | 27.0 | 28.0 | 31.0 | 95 | 108 | 80 | 92 | 94 | 110 | 100 |
| Vermont..... | 28.9 | 31.0 | 32.0 | 30.0 | 29.0 | 25.0 | 30.0 | 92 | 103 | 83 | 85 | 95 | 110 | 90 |
| New York..... | 27.3 | 30.6 | 29.0 | 28.3 | 29.0 | 27.5 | 22.1 | 80 | 91 | 77 | 75 | 80 | 78 | 84 |
| New Jersey..... | 31.5 | 29.0 | 27.0 | 33.0 | 37.0 | 30.0 | 22.0 | 187 | 92 | 88 | 85 | 83 | 86 | 85 |
| Pennsylvania..... | 25.3 | 26.5 | 25.5 | 27.0 | 28.0 | 27.0 | 24.5 | 82 | 90 | 86 | 80 | 83 | 84 | 90 |
| North Atlantic..... | 27.2 | 30.2 | 28.9 | 28.3 | 28.9 | 27.4 | 22.9 | 80.6 | 91.6 | 78.0 | 76.1 | 81.0 | 80.4 | 85.8 |
| Ohio..... | 27.3 | 28.0 | 31.0 | 32.0 | 27.0 | 27.6 | 23.5 | 70 | 85 | 70 | 62 | 72 | 60 | 61 |
| Indiana..... | 24.4 | 24.0 | 23.0 | 25.0 | 23.8 | 23.0 | 22.0 | 70 | 77 | 71 | 66 | 73 | 59 | 62 |
| Illinois..... | 30.4 | 32.0 | 33.0 | 31.0 | 29.5 | 29.5 | 26.5 | 65 | 75 | 63 | 58 | 73 | 53 | 56 |
| Michigan..... | 25.1 | 29.3 | 24.5 | 28.5 | 28.5 | 30.0 | 23.0 | 71 | 80 | 72 | 65 | 76 | 70 | 69 |
| Wisconsin..... | 31.5 | 32.0 | 36.8 | 34.5 | 34.5 | 37.1 | 32.5 | 69 | 78 | 66 | 65 | 75 | 65 | 65 |
| Minnesota..... | 26.4 | 32.0 | 30.0 | 25.0 | 30.0 | 30.0 | 27.0 | 56 | 69 | 52 | 51 | 65 | 50 | 48 |
| Iowa..... | 28.9 | 31.0 | 31.3 | 30.5 | 31.4 | 33.0 | 30.5 | 60 | 70 | 57 | 56 | 66 | 54 | 52 |
| Missouri..... | 25.8 | 25.0 | 31.0 | 24.0 | 23.0 | 22.0 | 17.0 | 86 | 82 | 95 | 80 | 95 | 80 | 80 |
| North Dakota..... | 19.8 | 26.0 | 22.5 | 14.3 | 25.5 | 25.5 | 14.2 | 50 | 62 | 43 | 46 | 59 | 43 | 42 |
| South Dakota..... | 23.2 | 27.0 | 26.0 | 10.1 | 30.0 | 21.7 | 18.5 | 52 | 64 | 47 | 52 | 58 | 48 | 45 |
| Nebraska..... | 24.3 | 25.0 | 24.3 | 20.7 | 30.8 | 32.6 | 29.2 | 55 | 63 | 54 | 58 | 55 | 51 | 50 |
| Kansas..... | 17.8 | 16.5 | 16.0 | 11.4 | 12.6 | 27.9 | 20.5 | 58 | 65 | 58 | 61 | 55 | 50 | 50 |
| North Central..... | 23.5 | 27.4 | 26.4 | 20.9 | 28.1 | 28.1 | 22.3 | 57.1 | 67.4 | 62.6 | 54.8 | 63.9 | 51.4 | 50.0 |
| Maryland..... | 31.9 | 35.0 | 33.0 | 34.3 | 30.5 | 32.0 | 32.0 | 85 | 93 | 87 | 80 | 87 | 85 | 82 |
| Virginia..... | 26.6 | 27.0 | 26.0 | 31.0 | 26.0 | 29.0 | 28.0 | 92 | 105 | 97 | 90 | 87 | 85 | 96 |
| North Carolina..... | 24.0 | 23.0 | 23.0 | 26.0 | 24.0 | 23.0 | 24.0 | 110 | 110 | 120 | 100 | 110 | 120 | 128 |
| South Atlantic..... | 27.8 | 28.8 | 27.4 | 29.9 | 26.0 | 26.4 | 26.7 | 93.4 | 100.9 | 98.4 | 90.4 | 97.1 | 101.5 | 107.9 |
| Kentucky..... | 27.0 | 24.0 | 26.0 | 33.0 | 27.0 | 25.0 | 29.5 | 91 | 101 | 95 | 86 | 91 | 91 | 99 |
| Tennessee..... | 22.4 | 20.0 | 23.0 | 30.0 | 19.0 | 20.0 | 20.0 | 103 | 110 | 110 | 96 | 100 | 110 | 102 |
| Oklahoma..... | 21.2 | 23.0 | 14.0 | 27.0 | 16.5 | 22.9 | 25.0 | 68 | 70 | 75 | 58 | 65 | 65 | 63 |
| Texas..... | 22.5 | 25.0 | 7.2 | 35.0 | 16.0 | 21.0 | 25.0 | 71 | 76 | 90 | 53 | 70 | 73 | 62 |
| South Central..... | 22.4 | 23.7 | 12.1 | 31.7 | 16.8 | 21.2 | 24.7 | 73.3 | 74.7 | 85.2 | 60.1 | 75.2 | 74.4 | 65.9 |
| Montana..... | 22.0 | 25.0 | 21.0 | 24.0 | 33.0 | 30.5 | 16.0 | 63 | 69 | 72 | 64 | 60 | 56 | 68 |
| Idaho..... | 35.4 | 31.0 | 44.0 | 37.0 | 44.0 | 43.0 | 39.0 | 65 | 82 | 56 | 60 | 68 | 63 | 66 |
| Wyoming..... | 30.4 | 29.0 | 33.0 | 33.0 | 34.0 | 28.0 | 27.0 | 64 | 72 | 61 | 62 | 61 | 61 | 64 |
| Colorado..... | 21.0 | 20.0 | 21.0 | 16.0 | 22.0 | 24.0 | 21.0 | 59 | 72 | 58 | 55 | 56 | 54 | 54 |
| New Mexico..... | 20.9 | 15.0 | 17.0 | 26.0 | 18.0 | 19.0 | 25.0 | 72 | 60 | 85 | 65 | 70 | 75 | 81 |
| Arizona..... | 33.8 | 30.0 | 35.0 | 35.0 | 35.0 | 38.0 | 35.0 | 89 | 88 | 100 | 85 | 75 | 80 | 85 |
| Utah..... | 35.5 | 28.5 | 43.0 | 40.0 | 47.0 | 49.0 | 40.0 | 78 | 87 | 85 | 72 | 76 | 73 | 78 |
| Nevada..... | 34.9 | 39.5 | 48.0 | 40.0 | 45.0 | 35.0 | 33.0 | 88 | 110 | 82 | 85 | 80 | 80 | 85 |
| Washington..... | 32.0 | 22.6 | 34.0 | 34.0 | 42.0 | 35.5 | 34.0 | 71 | 85 | 68 | 65 | 77 | 70 | 78 |
| Oregon..... | 29.2 | 22.9 | 33.0 | 28.0 | 35.0 | 35.0 | 37.0 | 76 | 100 | 73 | 65 | 77 | 72 | 77 |
| California..... | 27.2 | 21.0 | 31.0 | 30.0 | 27.5 | 30.5 | 29.6 | 82 | 116 | 75 | 58 | 93 | 72 | 70 |
| Far Western..... | 27.0 | 22.8 | 20.5 | 27.5 | 29.3 | 30.2 | 27.0 | 74.0 | 96.6 | 70.3 | 50.7 | 77.9 | 65.9 | 67.1 |
| United States..... | 24.8 | 26.2 | 26.7 | 23.2 | 28.1 | 28.4 | 23.2 | 62.5 | 74.1 | 58.8 | 57.5 | 67.8 | 55.2 | 65.0 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

14-year average.

84722°—30—42+

TABLE 81.—Barley: Acreage, yield per acre, and production in specified countries, average 1909-1919, 1921-1925, annual, 1927-1929

| Country | Acreage | | | Yield per acre | | | | Production | | | | | |
|--|----------------------------|----------------------------|--------|----------------|---------------------------|----------------------------|------|------------|---------------------------|-----------------------|---------|---------|---------------------------|
| | Aver- age 1909- 1913 | Aver- age 1921- 1925 | 1927 | 1928 | 1929, prelimi- nary | Aver- age 1921- 1925 | 1927 | 1928 | 1929, prelimi- nary | Average, 1921-1925 | 1927 | 1928 | 1929, prelimi- nary |
| NORTHERN HEMISPHERE | | | | | | | | | | | | | |
| NORTH AMERICA | | | | | | | | | | | | | |
| Canada..... | 1,574 | 3,022 | 3,506 | 4,381 | 5,936 | 28.8 | 25.4 | 27.6 | 17.3 | 76,899 | 99,388 | 136,381 | 102,313 |
| United States..... | 7,620 | 7,498 | 9,476 | 12,698 | 13,212 | 24.3 | 24.8 | 28.1 | 23.2 | 184,812 | 253,882 | 357,487 | 307,105 |
| Total..... | 9,194 | 10,520 | 12,982 | 17,479 | 19,138 | 25.0 | 25.0 | 27.9 | 21.4 | 261,711 | 353,270 | 493,873 | 409,418 |
| EUROPE | | | | | | | | | | | | | |
| England and Wales..... | 1,488 | 1,352 | 1,049 | 1,185 | 1,120 | 34.0 | 34.2 | 38.3 | 40.1 | 50,638 | 46,274 | 47,549 | 46,552 |
| Scotland..... | 191 | 158 | 117 | 112 | 101 | 37.6 | 38.6 | 37.5 | 42.9 | 7,173 | 6,092 | 6,807 | 4,713 |
| Irish Free State..... | 162 | 136 | 121 | 120 | 118 | 45.5 | 38.7 | 52.0 | 47.6 | 7,366 | 6,083 | 6,146 | 6,052 |
| Norway..... | 89 | 137 | 150 | 149 | 149 | 32.2 | 32.0 | 31.1 | 34.4 | 2,867 | 4,383 | 4,672 | 5,133 |
| Sweden..... | 448 | 409 | 302 | 272 | 323 | 33.6 | 31.6 | 30.2 | 35.8 | 15,083 | 12,921 | 9,743 | 10,803 |
| Denmark..... | 639 | 695 | 822 | 877 | 909 | 42.0 | 46.4 | 43.9 | 57.6 | 26,860 | 32,246 | 36,082 | 50,541 |
| Netherlands..... | 68 | 63 | 66 | 70 | 78 | 48.1 | 52.4 | 50.6 | 64.2 | 3,270 | 3,341 | 4,404 | 3,633 |
| Belgium..... | 88 | 84 | 79 | 77 | 95 | 50.5 | 49.1 | 52.8 | 56.7 | 4,446 | 4,127 | 4,304 | 4,193 |
| France..... | 1,987 | 1,713 | 1,747 | 1,756 | 1,853 | 26.6 | 25.6 | 28.8 | 31.9 | 52,825 | 43,892 | 50,327 | 50,023 |
| Spain..... | 3,510 | 4,343 | 4,452 | 4,449 | 4,426 | 21.3 | 21.2 | 20.7 | 18.6 | 74,689 | 92,220 | 82,852 | 97,109 |
| Portugal..... | 170 | 182 | 193 | 193 | 193 | 11.3 | 11.3 | 10.3 | 7.8 | 2,053 | 1,982 | 1,512 | 2,012 |
| Italy..... | 647 | 576 | 583 | 583 | 571 | 16.4 | 17.9 | 16.2 | 19.7 | 10,638 | 11,024 | 11,875 | 11,875 |
| Germany..... | 3,464 | 3,198 | 3,678 | 3,754 | 3,835 | 38.6 | 31.3 | 34.2 | 40.9 | 133,787 | 125,750 | 133,721 | 146,069 |
| Austria..... | 421 | 320 | 366 | 387 | 386 | 23.9 | 22.1 | 26.9 | 33.5 | 10,063 | 10,935 | 12,952 | 11,776 |
| Czechoslovakia..... | 2,275 | 1,673 | 1,746 | 1,770 | 1,839 | 31.3 | 30.0 | 33.6 | 36.2 | 71,108 | 58,657 | 64,398 | 58,660 |
| Hungary..... | 1,322 | 1,096 | 1,002 | 1,028 | 1,134 | 24.5 | 20.3 | 23.6 | 29.8 | 32,369 | 22,188 | 28,684 | 30,671 |
| Yugoslavia..... | 1,058 | 902 | 966 | 974 | 1,103 | 19.1 | 15.6 | 15.0 | 18.6 | 20,229 | 14,027 | 18,149 | 18,918 |
| Greece..... | 399 | 383 | 465 | 469 | 469 | 18.8 | 14.8 | 15.0 | 14.5 | 7,436 | 7,271 | 7,246 | 4,497 |
| Bulgaria..... | 516 | 539 | 551 | 551 | 551 | 20.1 | 17.2 | 22.9 | 22.0 | 10,380 | 9,266 | 12,867 | 12,148 |
| Rumania..... | 3,378 | 4,315 | 4,359 | 4,322 | 5,074 | 18.3 | 12.8 | 13.3 | 16.1 | 61,677 | 56,295 | 57,970 | 69,401 |
| Poland..... | 3,048 | 2,547 | 2,761 | 2,856 | 2,863 | 22.7 | 19.6 | 21.2 | 24.6 | 69,055 | 49,850 | 58,602 | 70,143 |
| Lithuania..... | 536 | 461 | 487 | 418 | 529 | 16.5 | 20.5 | 17.7 | 16.5 | 8,820 | 9,234 | 8,630 | 6,910 |
| Latvia..... | 463 | 414 | 458 | 362 | 451 | 17.1 | 16.9 | 13.0 | 9.0 | 7,922 | 6,979 | 3,275 | 9,810 |
| Estonia..... | 329 | 307 | 295 | 293 | 281 | 18.8 | 17.8 | 14.7 | 10.0 | 6,201 | 5,464 | 4,211 | 5,684 |
| Finland..... | 278 | 273 | 287 | 272 | 269 | 17.8 | 21.2 | 24.6 | 21.2 | 4,947 | 5,782 | 6,571 | 6,279 |
| Russia, European and Asiatic..... | 26,193 | 14,728 | 16,837 | 17,213 | 19,027 | 16.0 | 12.7 | 12.0 | 14.2 | 418,080 | 186,693 | 245,013 | 245,013 |
| Total Europe reporting area and production all years..... | 26,523 | 25,811 | 26,628 | 26,873 | 28,260 | 23.0 | 23.0 | 24.2 | 27.1 | 689,108 | 592,549 | 728,652 | 794,460 |
| Estimated European total ex- cluding Russia..... | 27,000 | 26,300 | 27,100 | 27,400 | 28,800 | | | | | 4,701,000 | 659,000 | 743,000 | 809,000 |

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| AFRICA | | | | | | | | | | | |
|--|--------|--------|--------|--------|------|------|------|------|-----------|-----------|-----------|
| Morocco..... | 2,862 | 2,469 | 2,905 | 3,006 | 14.1 | 13.9 | 16.6 | 12.8 | (38,000) | 40,304 | 54,231 |
| Algeria..... | 3,385 | 3,360 | 3,411 | 3,412 | 10.2 | 10.3 | 11.6 | 12.0 | 45,974 | 50,779 | 54,554 |
| Tunis..... | 1,228 | 856 | 1,236 | 6.4 | 6.7 | 4.8 | 8.7 | 9.3 | 7,836 | 4,137 | 12,631 |
| Egypt..... | 3,398 | 376 | 366 | 401 | 30.0 | 31.8 | 26.5 | 31.6 | 11,867 | 11,961 | 11,961 |
| Total..... | 8,021 | 7,061 | 8,137 | 8,055 | 12.9 | 12.0 | 13.7 | 12.5 | 103,667 | 89,353 | 84,883 |
| ASIA | | | | | | | | | | | |
| India..... | 8,877 | 6,976 | 6,357 | 6,825 | 19.2 | 18.6 | 14.3 | 12.5 | 145,496 | 133,798 | 119,047 |
| Syria and Lebanon..... | (450) | 1,852 | 892 | 750 | 10.7 | 23.4 | 15.4 | 32.1 | (5,000) | 7,300 | 15,225 |
| Japan..... | 3,042 | 2,343 | 2,242 | 2,202 | 31.4 | 35.2 | 26.3 | 36.5 | 95,784 | 82,482 | 81,477 |
| China..... | 1,623 | 2,139 | 2,200 | 2,294 | 17.1 | 16.1 | 15.5 | 16.4 | 32,243 | 36,607 | 35,312 |
| Total Northern Hemisphere countries reporting area and production all years..... | 48,833 | 51,859 | 57,832 | 60,699 | 23.7 | 21.8 | 25.3 | 23.9 | 1,155,889 | 1,071,227 | 1,225,799 |
| Estimated Northern Hemisphere total excluding Russia and China..... | 64,200 | 62,300 | 68,800 | 71,600 | | | | | 1,407,000 | 1,321,000 | 1,435,000 |
| SOUTHERN HEMISPHERE | | | | | | | | | | | |
| Chile..... | 111 | 160 | 168 | | 33.4 | 40.3 | 29.7 | | 4,000 | 5,247 | 6,755 |
| Argentina..... | 220 | 728 | 1,186 | 1,475 | 13.7 | 12.3 | 12.7 | 11.4 | 14,305 | 9,924 | 14,570 |
| Union of South Africa..... | 1,100 | 69 | 85 | 75 | 11.8 | 13.9 | 11.7 | 23.1 | 1,274 | 1,172 | 808 |
| Australia..... | 134 | 307 | 322 | 19.6 | 19.7 | 16.0 | | | 5,021 | 6,045 | 5,167 |
| Estimated Southern Hemisphere total..... | 800 | 1,700 | 2,400 | 2,300 | | | | | 18,000 | 31,000 | 43,000 |
| Total Northern and Southern Hemisphere countries, reporting area and production all years..... | 49,192 | 49,889 | 53,103 | 62,249 | 21.7 | 23.4 | 25.0 | 23.6 | 1,161,558 | 1,082,823 | 1,241,167 |
| Estimated world total excluding Russia and China..... | 65,000 | 63,800 | 65,200 | 73,900 | | | | | 1,425,000 | 1,352,000 | 1,478,000 |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Estimates given are for crops harvested during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

1 Where changes in boundary have occurred, averages are estimated for territory within present boundaries.

2 1 year only.

3 4 year average.

4 The estimate for the 5-year period, 1909-1913, given in this table is somewhat larger than the figure obtained by averaging the same 5 years in Table 82. This is because in this table estimates for warring countries are for post-war boundaries, whereas in Table 82 they are for pre-war territory. As a result, in excluding Russia, which lost territory during the war, a smaller area is excluded in this table than in Table 82.

5 Excludes native locations which produced 38,550 bushels in 1917-18 and 29,056 bushels in 1920-21.

TABLE 82.—*Barley: World production, 1894-1929*

| Year | Estimated world production excluding Russia | Estimated European production excluding Russia | Selected countries | | | | | | | |
|-------------------------|---|--|--------------------|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | United States | Russia ¹ | Germany | Japan | Canada | India | Spain | Rumania |
| | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels | 1,000,000 bushels |
| 1894..... | 935 | 544 | 78 | 277 | 131 | 81 | — | — | 57 | 17 |
| 1895..... | 1,008 | 527 | 115 | 226 | 128 | 80 | — | — | 47 | 22 |
| 1896..... | 973 | 528 | 99 | 254 | 125 | 71 | — | — | 36 | 32 |
| 1897..... | 907 | 481 | 103 | 239 | 118 | 73 | — | — | 46 | 21 |
| 1898..... | 1,040 | 564 | 100 | 307 | 130 | 83 | — | — | 73 | 30 |
| 1899..... | 1,017 | 533 | 117 | 227 | 137 | 77 | — | — | 54 | 6 |
| 1900..... | 1,269 | 522 | 96 | 237 | 138 | 82 | — | — | 57 | 15 |
| 1901..... | 1,085 | 570 | 122 | 210 | 153 | 83 | — | — | 80 | 24 |
| 1902..... | 1,127 | 592 | 149 | 338 | 142 | 74 | — | — | 81 | 25 |
| 1903..... | 1,099 | 589 | 147 | 357 | 153 | 60 | — | — | 64 | 30 |
| 1904..... | 1,068 | 512 | 162 | 346 | 135 | 81 | — | — | 54 | 12 |
| 1905..... | 1,067 | 532 | 170 | 347 | 134 | 77 | — | — | 46 | 26 |
| 1906..... | 1,226 | 610 | 192 | 351 | 143 | 84 | — | — | 90 | 34 |
| 1907..... | 1,161 | 569 | 170 | 377 | 161 | 90 | — | — | 54 | 20 |
| 1908..... | 1,132 | 536 | 185 | 402 | 141 | 87 | 47 | — | 70 | 13 |
| 1909..... | 1,338 | 621 | 188 | 502 | 161 | 87 | 55 | — | 79 | 20 |
| 1910..... | 1,242 | 560 | 174 | 488 | 133 | 82 | 29 | — | 76 | 20 |
| 1911..... | 1,326 | 606 | 160 | 437 | 145 | 86 | 44 | — | 87 | 26 |
| 1912..... | 1,345 | 589 | 224 | 496 | 160 | 91 | 49 | — | 90 | 21 |
| 1913..... | 1,400 | 637 | 240 | 600 | 169 | 101 | 48 | — | 69 | 27 |
| 1914..... | 1,213 | 546 | 195 | ² 433 | 144 | 86 | 36 | 125 | 72 | 26 |
| 1915..... | 1,244 | 477 | 229 | ³ 429 | 114 | 95 | 54 | 143 | 84 | 23 |
| 1916..... | 1,201 | 507 | 182 | ⁴ 305 | 128 | 89 | 43 | 148 | 87 | 30 |
| 1917..... | 1,170 | 427 | 212 | 325 | ⁵ 90 | 89 | 55 | 156 | 78 | — |
| 1918..... | 1,277 | 424 | 256 | — | 94 | 89 | 77 | 156 | 90 | ⁶ 5 |
| 1919..... | 1,120 | 483 | 148 | — | 88 | 95 | 56 | 130 | 82 | 32 |
| 1920..... | 1,252 | 555 | 189 | 216 | 82 | 92 | 63 | 150 | 90 | 68 |
| 1921..... | 1,240 | 555 | 155 | 118 | 89 | 88 | 60 | 117 | 89 | 44 |
| 1922..... | 1,396 | 588 | 182 | 176 | 74 | 87 | 72 | 146 | 78 | 94 |
| 1923..... | 1,416 | 649 | 198 | 196 | 108 | 71 | 77 | 145 | 112 | 61 |
| 1924..... | 1,312 | 566 | 182 | 181 | 110 | ⁶ 75 | 89 | 137 | 84 | 31 |
| 1925..... | 1,486 | 672 | 214 | 262 | 119 | 91 | 87 | 123 | 99 | 47 |
| 1926..... | 1,442 | 674 | 185 | 241 | 113 | 88 | 100 | 121 | 96 | 77 |
| 1927..... | 1,478 | 659 | 266 | 202 | 126 | 82 | 97 | 119 | 92 | 58 |
| 1928..... | 1,717 | 743 | 357 | 245 | 154 | 81 | 136 | 98 | 83 | 69 |
| 1929 ⁷ | — | 809 | 307 | — | 146 | 80 | 102 | — | 97 | 126 |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

¹ Includes all Russian territory reporting for the years shown.

² Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.

³ Exclusive of Russian Poland, Lithuania, parts of present Latvia and the Ukraine, and two Provinces of Transcaucasia.

⁴ Beginning this year estimates within present boundaries of the Union of Socialist Soviet Republics excluding Turkestan, Transcaucasia, and the Far East, which regions in 1924 produced 20,897,000 bushels.

⁵ Postwar boundaries beginning this year and therefore not comparable with earlier years.

⁶ Beginning this year weighed bushels, those reported for the earlier years being measured bushels.

⁷ Preliminary.

TABLE 83.—*Barley: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917-1928*

| Year beginning July | Percentage of year's receipts | | | | | | | | | | | |
|---------------------|-------------------------------|------|-------|------|------|------|------|------|------|------|------|------|
| | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June |
| 1917..... | 2.2 | 15.0 | 23.4 | 16.5 | 8.5 | 8.6 | 6.5 | 7.5 | 6.1 | 2.9 | 1.8 | 1.0 |
| 1918..... | 1.9 | 9.8 | 13.6 | 10.5 | 7.9 | 7.8 | 8.1 | 5.4 | 7.2 | 9.0 | 11.6 | 7.2 |
| 1919..... | 18.5 | 19.2 | 14.3 | 9.9 | 6.4 | 7.5 | 5.4 | 3.1 | 3.7 | 3.4 | 3.0 | 5.0 |
| 1920..... | 7.0 | 16.5 | 15.0 | 9.9 | 9.9 | 7.2 | 6.7 | 5.5 | 6.5 | 4.2 | 5.7 | 5.9 |
| 1921..... | 35.0 | 14.0 | 10.5 | 7.8 | 4.4 | 4.2 | 3.9 | 4.3 | 4.2 | 3.0 | 4.4 | 4.3 |
| 1922..... | 17.4 | 22.9 | 14.6 | 10.8 | 5.2 | 6.0 | 4.8 | 3.2 | 3.5 | 1.9 | 2.7 | 7.0 |
| 1923..... | 10.3 | 23.7 | 15.1 | 9.9 | 7.8 | 6.5 | 4.1 | 3.5 | 3.1 | 2.6 | 2.3 | 11.1 |
| 1924..... | 9.0 | 16.8 | 21.4 | 17.0 | 8.1 | 5.7 | 5.1 | 3.8 | 3.3 | 2.6 | 2.7 | 4.7 |
| 1925..... | 16.4 | 19.1 | 18.4 | 11.7 | 6.6 | 5.1 | 4.0 | 3.4 | 3.1 | 2.0 | 3.3 | 6.9 |
| 1926..... | 17.4 | 16.5 | 11.6 | 7.4 | 6.2 | 4.8 | 5.1 | 3.2 | 3.9 | 3.6 | 4.1 | 16.2 |
| 1927..... | 9.1 | 17.4 | 18.7 | 12.2 | 8.0 | 5.7 | 4.7 | 4.5 | 4.5 | 2.1 | 2.7 | 10.4 |
| 1928..... | 12.6 | 21.4 | 18.3 | 11.8 | 6.7 | 6.0 | 3.5 | 3.9 | 3.2 | 2.7 | 2.5 | 7.4 |

TABLE 84.—*Barley: Commercial stocks in store, 1926-27 to 1929-30*DOMESTIC BARLEY IN UNITED STATES¹

| | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July |
|---------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1926-27 | | | | | | | | | | | | |
| 1927-28 | 3, 108 | 5, 041 | 6, 549 | 5, 957 | 5, 769 | 7, 097 | 6, 064 | 6, 110 | 5, 339 | 3, 675 | 3, 040 | 2, 720 |
| 1928-29 | 3, 395 | 9, 318 | 10, 081 | 11, 067 | 11, 744 | 4, 825 | 4, 423 | 4, 273 | 4, 588 | 3, 890 | 2, 410 | 2, 801 |
| 1929-30 | 8, 798 | 12, 894 | 12, 563 | 12, 721 | 11, 760 | 10, 926 | 11, 985 | 11, 399 | 9, 998 | 8, 412 | 7, 373 | 6, 861 |

UNITED STATES BARLEY IN CANADA

| 1926-27 | | | | | | 272 | 300 | 64 | 70 | 59 | 0 | 13 |
|---------|-----|-----|--------|--------|--------|--------|-----|-----|-----|----|----|-----|
| 1927-28 | 5 | 66 | 665 | 344 | 152 | 40 | 42 | 9 | 25 | 9 | 1 | 20 |
| 1928-29 | 0 | 767 | 4, 171 | 5, 599 | 2, 319 | 1, 144 | 312 | 173 | 170 | 81 | 92 | 659 |
| 1929-30 | 279 | 246 | 1, 266 | 1, 749 | 955 | | | | | | | |

CANADIAN BARLEY IN UNITED STATES¹

| 1926-27 | | | | | | 2, 942 | 2, 246 | 1, 677 | 608 | 2, 401 | 1, 573 | 175 |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1927-28 | 19 | 27 | 27 | 717 | 1, 768 | 1, 945 | 1, 499 | 1, 191 | 557 | 112 | 483 | 278 |
| 1928-29 | 300 | 249 | 1, 751 | 2, 959 | 4, 778 | 6, 210 | 4, 731 | 3, 232 | 2, 259 | 2, 523 | 3, 315 | 2, 110 |
| 1929-30 | 2, 277 | 1, 711 | 1, 654 | 1, 909 | 2, 637 | | | | | | | |

Bureau of Agricultural Economics. Compiled from weekly reports to the Grain, Hay and Feed Market News Service. Data are for stocks on the Saturday nearest the 1st day of the month.

¹ Includes barley in store in public and private elevators in 39 important markets and also barley afloat in vessels or barges in harbors of lake and seaboard ports. Barley in transit either by rail or water, mill stocks, or small private stocks of barley intended only for local purposes, not included.

² Includes barley stored at lake and seaboard ports, exclusive of barley in transit on lakes and canals.

TABLE 85.—*Barley: Farm stocks, growing conditions, and shipments, United States, 1910-1929*

| Year beginning August | Stocks of old barley on farms Aug. 1 ¹ | Condition of new crop | | | | Weight per measured bushel of new barley ² | Stocks of barley on farms on Mar. 1 following ¹ | Shipped out of county where grown ¹ |
|-----------------------|---|-----------------------|----------|----------|----------|---|--|--|
| | | June 1 | July 1 | Aug. 1 | Sept. 1 | | | |
| | 1,000 bushels | Per cent | Per cent | Per cent | Per cent | Pounds | 1,000 bushels | 1,000 bushels |
| 1910 | 8, 075 | 89.6 | 73.7 | 70.0 | 69.8 | 46.9 | 33, 498 | 86, 955 |
| 1911 | 5, 763 | 90.2 | 72.1 | 66.2 | 65.5 | 46.0 | 24, 754 | 91, 620 |
| 1912 | 2, 591 | 91.1 | 88.3 | 89.1 | 88.9 | 46.8 | 62, 301 | 120, 143 |
| 1913 | 11, 252 | 87.1 | 76.6 | 74.9 | 73.4 | 46.5 | 44, 126 | 86, 262 |
| 1914 | 7, 609 | 95.5 | 92.6 | 85.3 | 82.4 | 46.2 | 42, 889 | 87, 834 |
| 1915 | 6, 336 | 94.6 | 94.1 | 93.8 | 94.2 | 47.4 | 58, 301 | 98, 965 |
| 1916 | 10, 982 | 86.3 | 87.9 | 80.0 | 74.6 | 45.2 | 33, 244 | 79, 257 |
| 1917 | 3, 775 | 89.3 | 85.4 | 77.9 | 70.3 | 46.6 | 44, 419 | 84, 056 |
| 1918 | 4, 510 | 90.5 | 84.7 | 82.0 | 81.5 | 46.9 | 81, 746 | 99, 987 |
| 1919 | 11, 897 | 91.7 | 87.4 | 73.6 | 69.2 | 45.2 | 33, 820 | 50, 471 |
| 1920 | 4, 122 | 87.6 | 87.6 | 84.9 | 82.5 | 46.0 | 65, 229 | 68, 663 |
| 1921 | 13, 487 | 87.1 | 81.4 | 71.4 | 68.4 | 44.4 | 42, 294 | 55, 738 |
| 1922 | 7, 497 | 90.1 | 82.6 | 82.0 | 81.2 | 46.2 | 42, 469 | 66, 560 |
| 1923 | 6, 805 | 89.0 | 86.1 | 82.6 | 79.5 | 45.3 | 44, 930 | 68, 190 |
| 1924 | 6, 359 | 79.5 | 80.2 | 80.7 | 82.5 | 47.0 | 40, 576 | 68, 071 |
| 1925 | 5, 728 | 83.1 | 81.2 | 79.5 | 80.3 | 45.9 | 52, 253 | 80, 547 |
| 1926 | 9, 622 | 81.0 | 73.3 | 69.8 | 68.7 | 45.9 | 39, 183 | 55, 983 |
| 1927 | 3, 754 | 81.5 | 84.2 | 83.3 | 82.9 | 46.8 | 61, 972 | 87, 975 |
| 1928 | 7, 751 | 82.7 | 81.3 | 86.5 | 84.4 | 46.6 | 97, 167 | 118, 355 |
| 1929 ³ | 17, 071 | 83.7 | 76.7 | 70.1 | 68.8 | 45.9 | | |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Based on percentages of entire crop as reported by crop reporters.

² Average weight per measured bushel as reported by crop reporters.

³ Preliminary.

TABLE 86.—*Barley: Receipts at specified markets, 1921-1928*

| Year beginning August | Minneapolis | Duluth | Chicago | Milwaukee | Omaha | Total 5 markets | Fort William and Port Arthur ¹ |
|-------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|---|
| | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| 1921..... | 11,926 | 5,179 | 7,573 | 9,330 | 1,152 | 35,160 | 11,597 |
| 1922..... | 14,244 | 3,844 | 10,103 | 8,422 | 801 | 37,914 | 15,756 |
| 1923..... | 15,396 | 3,654 | 9,755 | 9,077 | 948 | 38,830 | 15,910 |
| 1924..... | 23,158 | 14,501 | 11,336 | 13,127 | 796 | 62,918 | 28,045 |
| 1925..... | 23,245 | 13,244 | 9,540 | 10,673 | 729 | 57,431 | 30,062 |
| 1926..... | 12,086 | 6,667 | 8,386 | 8,440 | 594 | 36,173 | 33,784 |
| 1927..... | 22,982 | 22,630 | 11,320 | 11,061 | 1,768 | 69,761 | 23,652 |
| 1928 ² | 27,174 | 32,764 | 16,680 | 13,554 | 2,259 | 92,431 | 45,017 |

Bureau of Agricultural Economics. Compiled from reports of Minneapolis Chamber of Commerce, Duluth Board of Trade, Chicago Board of Trade, Milwaukee Chamber of Commerce, Omaha Grain Exchange, American Elevator and Grain Trade, and Canadian Grain Statistics.

¹ Crop year begins September.

² Beginning January, 1929, figures are subject to revision.

TABLE 87.—*Barley: Classification of cars graded by licensed inspectors, all inspection points*

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE, BY CARS, ANNUAL 1926-1928

| Year and class | Receipts of - | | | | | | | | | | | |
|-------------------------|---------------|-------------|--------------|---------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Choice No. 1 | No. 1 | Choice No. 2 | Special No. 2 | No. 2 | Choice No. 3 | No. 3 | No. 4 | No. 5 | No. 1 feed | Sample | Total |
| Beginning July— | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| 1926 ¹ | 251 | 481 | 107 | 2,168 | 2,005 | 421 | 4,929 | 4,026 | 266 | 916 | 15,063 | 30,633 |
| 1927..... | 262 | 2,199 | 90 | 14,913 | 12,151 | 274 | 16,299 | 6,197 | 183 | 2,875 | 10,923 | 66,366 |
| 1928..... | 329 | 966 | 100 | 13,128 | 20,900 | 392 | 25,264 | 20,129 | 135 | 6,500 | 11,021 | 98,864 |

TOTAL INSPECTIONS, BY GRADE AND CLASS, JULY 1, 1928, TO JUNE 30, 1929

| | | | | | | | | | | | | |
|---------------------|-----|-----|----|--------|--------|-----|--------|--------|----|-------|--------|--------|
| Barley..... | 5 | 619 | 49 | 13,125 | 20,594 | 130 | 24,026 | 19,856 | 35 | 6,499 | 10,821 | 96,659 |
| Black..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Bright Western..... | 290 | 312 | 48 | 3 | 290 | 222 | 268 | 221 | 89 | 0 | 163 | 1,906 |
| Western..... | 29 | 27 | 3 | 0 | 11 | 40 | 62 | 48 | 11 | 0 | 33 | 264 |
| Bright 2-Rowed..... | 1 | 2 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | 8 |
| 2-Rowed..... | 4 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 8 |
| Mixed..... | 0 | 5 | 0 | 0 | 2 | 0 | 6 | 3 | 0 | 0 | 2 | 18 |

Bureau of Agricultural Economics.

¹ Barley grades became effective Aug. 24, 1926.

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TABLE 88.—*Barley, excluding flour and malt: International trade, averages 1910-1914, annual 1926-1929*

| Country | Year ended June 30 | | | | | | | | | |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Average, 1910-1914 | | 1926 | | 1927 | | 1928 | | 1929 preliminary | |
| | Im- port | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| Canada..... | 66 | 5,210 | 10 | 30,803 | 29 | 42,533 | 3 | 25,131 | 8 | 38,668 |
| Rumania..... | ¹ 63 | ¹ 16,804 | 0 | 12,675 | 0 | ³ 31,836 | 0 | 124,509 | — | — |
| United States..... | 0 | 7,896 | 0 | 27,181 | 0 | 17,044 | 0 | 36,580 | 0 | 56,996 |
| Russia..... | ¹ 124 | ¹ 173,240 | 0 | 36,940 | 0 | 20,465 | — | — | — | — |
| Argentina..... | 43 | ⁴ 764 | — | 6,383 | — | 14,217 | — | 11,598 | — | — |
| British India..... | ¹ 23 | ¹ 10,640 | — | 697 | — | 408 | — | 8,289 | — | 1,402 |
| Czechoslovakia..... | 0 | 0 | 1,709 | 5,134 | 9 | 5,070 | 64 | 7,367 | 14 | 3,643 |
| Poland..... | 0 | 0 | 94 | 7,374 | 111 | 4,678 | 138 | 3,054 | 102 | 7,989 |
| Chile..... | ⁴ 88 | ⁴ 1,062 | 0 | 2,480 | 0 | 5,516 | 0 | 2,478 | 0 | 2,137 |
| Algeria..... | ¹ 213 | ¹ 5,482 | 282 | 4,504 | 2,736 | 388 | 166 | 6,671 | — | — |
| Tunis..... | ¹ 328 | ¹ 3,055 | — | 2,677 | — | 3,747 | 1,309 | 1,016 | — | — |
| Australia..... | ⁴ 159 | ⁴ 51 | 0 | 760 | 1 | 2,106 | — | — | — | — |
| Hungary..... | ¹ 229 | ¹ 11,836 | 2 | 2,264 | 3 | 2,323 | 5 | 2,221 | 2 | 1,274 |
| Bulgaria..... | 0 | ¹ 1,876 | 0 | 1,117 | 0 | 1,025 | 0 | 3,488 | — | — |
| Sweden..... | ¹ 28 | ¹ 102 | 14 | 523 | 5 | 1,878 | 40 | 16 | 3 | 24 |
| Yugoslavia ⁶ | 0 | 0 | — | 825 | — | 1,284 | 375 | 1,095 | 481 | 256 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| Germany..... | 148,297 | 136 | 53,090 | 525 | 97,886 | 75 | 85,765 | 199 | 78,441 | 400 |
| United Kingdom..... | 48,550 | — | 35,712 | — | 28,708 | — | 31,033 | — | 31,392 | — |
| Netherlands..... | ¹ 38,039 | ¹ 26,975 | 14,905 | 425 | 13,603 | 590 | 10,177 | 711 | 17,045 | 1,150 |
| Belgium..... | 18,351 | 3,079 | 13,361 | 250 | 11,618 | 205 | 11,856 | 333 | 14,616 | 192 |
| Denmark..... | ¹ 2,994 | ¹ 2,906 | 2,914 | 2,909 | 3,100 | 2,635 | 2,294 | 3,291 | 1,630 | 2,884 |
| Austria..... | ¹ 716 | ¹ 8,123 | 3,772 | — | 2,962 | 159 | 2,840 | 315 | — | — |
| Switzerland..... | ¹ 1,140 | ¹ 1 | 3,102 | 0 | 2,534 | 0 | 2,841 | 0 | 4,252 | 0 |
| France..... | 6,711 | 787 | 2,188 | 701 | 1,708 | 263 | 1,495 | 3,108 | 5,514 | 452 |
| Norway..... | ¹ 4,550 | 0 | 1,652 | 0 | 1,227 | 0 | 1,314 | 0 | 1,102 | 0 |
| Greece..... | 0 | 0 | 314 | 0 | 1,028 | 0 | 145 | 0 | 603 | 0 |
| Irish Free State..... | 0 | 0 | 1,613 | 55 | 418 | 996 | 480 | 612 | 849 | 435 |
| Spain..... | 640 | 117 | 1,560 | 258 | 1 | 1,079 | — | — | — | — |
| Cuba..... | 255 | 0 | 536 | 0 | 328 | 0 | 171 | 0 | — | — |
| Egypt..... | ¹ 732 | ¹ 42 | 314 | 0 | 665 | 25 | 11 | 674 | 1 | 717 |
| Italy..... | 824 | 20 | 127 | 76 | 326 | 1 | 273 | 16 | 128 | 17 |
| Syria and Lebanon..... | 0 | 0 | ³ 453 | 0 | ³ 234 | 0 | — | — | — | — |
| Estonia..... | 0 | 0 | ³ 273 | 0 | 81 | 0 | 195 | 0 | 516 | 0 |
| Total, 33 countries..... | 273,123 | 280,294 | 137,997 | 147,626 | 170,330 | 160,046 | 155,999 | 142,802 | 156,702 | 118,654 |

Bureau of Agricultural Economics. Official sources except where otherwise stated.

¹ Year ended July 31—International Yearbook of Agricultural Statistics.

² Average for season 1911-12 to 1913-14.

³ International Crop Report and Agricultural Statistics.

⁴ Average for calendar year 1909-1913.

⁵ Average for season 1909-10 to 1911-12.

⁶ Year ended December 31.

⁷ Average for season 1912-13 to 1913-14.

TABLE 89.—*Barley: Estimated average price per bushel, received by producers United States, 1909-1929*

| Year beginning August | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Weighted average |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909..... | 57.9 | 54.0 | 53.4 | 53.6 | 55.8 | 58.4 | 59.8 | 60.0 | 58.1 | 56.1 | 54.8 | 54.3 | 55.6 |
| 1910..... | 56.0 | 56.6 | 55.7 | 56.6 | 58.8 | 62.0 | 63.6 | 66.0 | 71.6 | 73.9 | 72.0 | 69.7 | 60.8 |
| 1911..... | 73.2 | 79.4 | 83.3 | 85.9 | 86.6 | 88.8 | 91.1 | 91.6 | 94.2 | 93.6 | 86.5 | 74.4 | 81.9 |
| 1912..... | 60.2 | 54.2 | 54.3 | 52.2 | 50.2 | 50.6 | 50.2 | 48.8 | 48.4 | 50.5 | 53.2 | 52.2 | 52.7 |
| 1913..... | 53.0 | 56.0 | 55.8 | 54.2 | 53.0 | 52.3 | 51.8 | 51.4 | 50.5 | 49.2 | 48.3 | 46.3 | 53.0 |
| 1914..... | 48.8 | 52.2 | 51.8 | 53.0 | 54.3 | 58.6 | 65.3 | 66.2 | 64.2 | 62.9 | 58.9 | 56.2 | 54.8 |
| 1915..... | 54.3 | 49.4 | 48.4 | 50.8 | 53.2 | 58.3 | 60.6 | 58.4 | 58.4 | 59.6 | 59.4 | 59.3 | 53.8 |
| 1916..... | 66.1 | 74.7 | 79.8 | 85.6 | 87.6 | 89.9 | 94.8 | 99.6 | 111.2 | 119.7 | 113.0 | 110.6 | 83.4 |
| 1917..... | 112.2 | 112.0 | 112.6 | 112.5 | 120.1 | 129.2 | 146.5 | 165.6 | 164.4 | 147.0 | 126.9 | 114.2 | 122.5 |
| 1918..... | 105.4 | 98.2 | 95.2 | 93.3 | 91.5 | 89.0 | 86.1 | 89.0 | 98.3 | 106.6 | 108.8 | 113.6 | 100.0 |
| 1919..... | 117.2 | 115.4 | 116.2 | 118.8 | 125.4 | 133.6 | 133.2 | 134.6 | 143.2 | 147.4 | 145.2 | 131.5 | 124.9 |
| 1920..... | 113.0 | 98.1 | 86.4 | 76.5 | 67.8 | 60.8 | 57.0 | 55.6 | 51.8 | 50.4 | 51.1 | 50.0 | 70.7 |
| 1921..... | 48.2 | 46.2 | 43.6 | 41.8 | 42.8 | 44.0 | 47.0 | 51.2 | 54.6 | 57.0 | 55.0 | 51.0 | 48.4 |
| 1922..... | 47.7 | 46.2 | 49.2 | 52.0 | 55.6 | 56.8 | 56.2 | 58.0 | 59.0 | 60.8 | 58.3 | 54.7 | 51.8 |
| 1923..... | 52.2 | 51.9 | 54.7 | 55.2 | 57.6 | 56.5 | 58.0 | 60.0 | 61.0 | 60.0 | 61.9 | 68.8 | 56.6 |
| 1924..... | 75.7 | 75.6 | 81.4 | 79.7 | 76.2 | 82.4 | 84.8 | 81.5 | 76.1 | 75.9 | 76.4 | 73.5 | 77.4 |
| 1925..... | 67.1 | 60.8 | 57.6 | 58.0 | 58.4 | 59.5 | 56.3 | 54.6 | 54.8 | 55.1 | 53.7 | 55.3 | 59.2 |
| 1926..... | 55.0 | 52.9 | 54.4 | 56.0 | 56.4 | 58.0 | 61.3 | 62.2 | 64.1 | 68.4 | 76.3 | 71.4 | 61.9 |
| 1927..... | 69.0 | 69.5 | 66.8 | 66.8 | 71.5 | 73.6 | 75.4 | 79.4 | 84.1 | 84.5 | 81.7 | 77.6 | 72.7 |
| 1928..... | 58.9 | 54.1 | 55.2 | 54.5 | 55.0 | 56.2 | 60.5 | 60.1 | 58.0 | 55.3 | 52.6 | 55.6 | 56.1 |
| 1929..... | 55.8 | 55.2 | 54.7 | 53.8 | 54.6 | | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of barley for each State; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, August, 1909-December, 1923.

TABLE 90.—*Barley, No. 2: Weighted average price¹ per bushel of reported cash sales, Minneapolis, 1909-1929*

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Weighted average |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909..... | 45 | 48 | 49 | 52 | 57 | 61 | 60 | 58 | 54 | 54 | 53 | 60 | 54 |
| 1910..... | 61 | 63 | 63 | 66 | 70 | 77 | 74 | 81 | 88 | 75 | 77 | 87 | 74 |
| 1911..... | 85 | 94 | 95 | 98 | 91 | 105 | 100 | 95 | 101 | 99 | 76 | 60 | 92 |
| 1912..... | 46 | 49 | 50 | 47 | 45 | 49 | 48 | 46 | 46 | 50 | 52 | 48 | 48 |
| 1913..... | 58 | 61 | 56 | 53 | 50 | 52 | 50 | 48 | 47 | 48 | 47 | 45 | 51 |
| 1914..... | 59 | 58 | 55 | 59 | 57 | 68 | 75 | 70 | 70 | 70 | 66 | 68 | 65 |
| 1915..... | 59 | 48 | 51 | 56 | 61 | 70 | 66 | 65 | 68 | 70 | 68 | 69 | 63 |
| 1916..... | 81 | 81 | 103 | 111 | 107 | 117 | 117 | 121 | 136 | 148 | 138 | 149 | 117 |
| 1917..... | 131 | 133 | 128 | 127 | 149 | 156 | 188 | 212 | 182 | 146 | 123 | 118 | 149 |
| 1918..... | 102 | 95 | 91 | 94 | 92 | 90 | 87 | 93 | 109 | 113 | 112 | 121 | 100 |
| 1919..... | 133 | 127 | 129 | 133 | 152 | 152 | 137 | 151 | 160 | 174 | 149 | 116 | 143 |
| 1920..... | 102 | 99 | 92 | 82 | 74 | 69 | 65 | 67 | 61 | 59 | 57 | 62 | 74 |
| 1921..... | 58 | 55 | 50 | 54 | 47 | 51 | 56 | 58 | 61 | 62 | 56 | 56 | 55 |
| 1922..... | 49 | 54 | 57 | 60 | 61 | 57 | 60 | 59 | 64 | 61 | 58 | 59 | 58 |
| 1923..... | 56 | 58 | 60 | 61 | 62 | 62 | 68 | 70 | 75 | 70 | 73 | 76 | 63 |
| 1924..... | 80 | 81 | 85 | 81 | 87 | 93 | 94 | 88 | 81 | 84 | 84 | 84 | 84 |
| 1925..... | 72 | 66 | 65 | 63 | 65 | 65 | 62 | 62 | 63 | 65 | 64 | 67 | 67 |
| 1926..... | 63 | 62 | 65 | 64 | 67 | 69 | 71 | 72 | 77 | 88 | 88 | 81 | 71 |
| 1927..... | 77 | 72 | 73 | 77 | 83 | 84 | 87 | 90 | 92 | 93 | 94 | 85 | 84 |
| 1928..... | 65 | 63 | 63 | 62 | 62 | 66 | 70 | 67 | 65 | 60 | 60 | 69 | 65 |
| 1929..... | 61 | 60 | 59 | 60 | 59 | | | | | | | | |

Bureau of Agricultural Economics. Compiled from Minneapolis Daily Market Record.

¹ Average of daily prices weighted by car-lot sales.

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TABLE 91.—Flaxseed: Acreage, production, value, foreign trade, net supply, etc., United States, 1909-1929

| Year | Acreage | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Price per bushel of No. 1 flaxseed at Minneapolis, year beginning Sept. 1 ¹ | Flaxseed, including linseed oil, in terms of seed. Year beginning September 1 ² | | | Net supply |
|-------------------------|-------------|------------------------|---------------|---|-------------------|--|--|-------------------------------|---------------|---------------|
| | | | | | | | Imports | Exports, domestic and foreign | Net imports | |
| | 1,000 acres | Bushels of 56 lbs. | 1,000 bushels | Cents | 1,000 dollars | Cents | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1909..... | 2,083 | 8.4 | 19,513 | 152.8 | 30,093 | 206 | 6,074 | 152 | 5,922 | 25,621 |
| 1909..... | 2,083 | 9.5 | 19,699 | 152.8 | 30,093 | 206 | 6,074 | 152 | 5,922 | 25,621 |
| 1910..... | 2,467 | 5.2 | 12,718 | 231.7 | 29,472 | 249 | 12,010 | 73 | 11,937 | 24,655 |
| 1911..... | 2,757 | 7.0 | 19,370 | 182.1 | 35,272 | 214 | 7,848 | 126 | 7,722 | 27,092 |
| 1912..... | 2,851 | 9.8 | 28,073 | 114.7 | 32,202 | 138 | 3,845 | 897 | 2,948 | 31,021 |
| 1913..... | 2,291 | 7.8 | 17,853 | 119.9 | 21,399 | 152 | 9,772 | 216 | 9,556 | 27,409 |
| 1914..... | 1,645 | 8.4 | 13,749 | 126.0 | 17,318 | 170 | 12,729 | 571 | 12,158 | 25,907 |
| 1915..... | 1,387 | 10.1 | 14,030 | 174.0 | 24,410 | 204 | 14,441 | 313 | 14,128 | 28,158 |
| 1916..... | 1,474 | 9.7 | 14,290 | 248.6 | 35,541 | 291 | 10,946 | 507 | 10,439 | 24,735 |
| 1917..... | 1,984 | 4.6 | 9,164 | 296.6 | 27,182 | 378 | 14,042 | 467 | 13,575 | 22,739 |
| 1918..... | 1,910 | 7.0 | 13,369 | 340.1 | 45,470 | 419 | 9,230 | 482 | 8,748 | 22,117 |
| 1919..... | 1,261 | 5.5 | 6,653 | — | — | — | — | — | — | — |
| 1919..... | 1,503 | 4.8 | 7,178 | 438.5 | 31,475 | 452 | 20,483 | 467 | 26,016 | 33,194 |
| 1920..... | 1,757 | 6.1 | 10,752 | 176.7 | 18,999 | 209 | 16,174 | 219 | 15,955 | 26,707 |
| 1921..... | 1,108 | 7.2 | 8,029 | 145.1 | 11,648 | 219 | 23,389 | 149 | 23,240 | 31,269 |
| 1922..... | 1,113 | 9.3 | 10,375 | 211.5 | 21,941 | 258 | 29,009 | 161 | 28,848 | 39,223 |
| 1923..... | 2,014 | 8.5 | 17,060 | 210.7 | 35,951 | 244 | 19,557 | 145 | 19,412 | 36,472 |
| 1924..... | 3,435 | 8.2 | 28,246 | — | — | — | — | — | — | — |
| 1924..... | 3,469 | 9.1 | 31,547 | 227.4 | 71,728 | 263 | 12,849 | 124 | 12,725 | 44,272 |
| 1925..... | 3,078 | 7.3 | 22,424 | 226.5 | 50,783 | 252 | 20,858 | 148 | 20,710 | 43,134 |
| 1926..... | 2,907 | 6.7 | 19,335 | 194.0 | 37,510 | 224 | 24,155 | 112 | 24,043 | 43,378 |
| 1927..... | 2,837 | 9.1 | 25,847 | 186.0 | 48,079 | 220 | 18,177 | 120 | 18,057 | 43,904 |
| 1928..... | 2,675 | 7.4 | 19,928 | 201.2 | 40,098 | 233 | 23,554 | 106 | 23,448 | 42,769 |
| 1929 ⁴ | 2,990 | 5.6 | 16,838 | 284.3 | 47,871 | — | — | — | — | — |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns. See 1927 Yearbook, page 809, for data for earlier years.

¹ The figures shown, 1909-1920, are averages of daily closing prices compiled from annual reports of the Minneapolis Chamber of Commerce; 1921-1928, are averages of daily prices weighted by car-lot sales, compiled from Minneapolis Daily Market Record.

² Compiled from Commerce and Navigation of the United States, 1909-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June, July, and August issues, 1919-1929, January issues, 1927-1929, and official records of the Bureau of Foreign and Domestic Commerce. 1 bushel of flaxseed weighs 56 pounds; 1 bushel of seed yields 2½ gallons of oil; and 1 gallon of oil weighs 7½ pounds.

³ Production minus net exports or plus net imports.

⁴ Preliminary.

TABLE 92.—Flaxseed: Acreage and production, by States, average 1923-1927 annual 1926-1929

| State | Acreage | | | | | Production | | | | |
|--------------------|--------------------|-------------|-------------|-------------|-------------------|--------------------|---------------|---------------|---------------|-------------------|
| | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ¹ | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Wisconsin..... | 10 | 11 | 10 | 9 | 7 | 123 | 132 | 132 | 122 | 84 |
| Minnesota..... | 710 | 814 | 757 | 726 | 523 | 7,156 | 7,652 | 7,343 | 5,808 | 4,707 |
| Iowa..... | 12 | 15 | 19 | 19 | 11 | 131 | 174 | 228 | 198 | 124 |
| Missouri..... | 13 | 2 | 7 | 7 | 6 | 20 | 16 | 46 | 56 | 36 |
| North Dakota..... | 1,401 | 1,380 | 1,242 | 1,143 | 1,463 | 10,255 | 7,590 | 10,184 | 8,344 | 6,876 |
| South Dakota..... | 492 | 475 | 504 | 554 | 637 | 3,925 | 2,755 | 5,940 | 3,601 | 3,758 |
| Nebraska..... | 6 | 7 | 7 | 8 | 17 | 57 | 61 | 70 | 64 | 129 |
| Kansas..... | 39 | 38 | 31 | 25 | 23 | 258 | 262 | 170 | 172 | 136 |
| Montana..... | 187 | 165 | 170 | 183 | 293 | 1,313 | 693 | 1,734 | 1,556 | 938 |
| Wyoming..... | — | — | — | 1 | 10 | — | — | — | 7 | 50 |
| United States..... | 2,801 | 2,907 | 2,837 | 2,675 | 2,990 | 23,243 | 19,335 | 25,847 | 19,928 | 16,838 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.

² 4-year average.

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| NORTH AFRICA | | | | | | | | | |
|---|------------|------------|------------|------------|---------|---------|---------|-----------|-----------|
| Kenya | 7,154 | 7,154 | 284 | 43,000 | 7,245 | 363 | 1,090 | | |
| Morocco | 40,844 | 59,000 | 54,000 | 43,000 | 7,245 | 363 | 1,090 | | |
| Algeria | 1,368 | 643 | 7,000 | 5,400 | 37 | 30 | 39 | 188 | 141 |
| Tunis | 5,966 | 6,156 | 2,952 | 4,249 | 37 | 31 | 34 | 7,265 | 2,096 |
| Egypt | 3,181 | 3,181 | 3,181 | 3,181 | 37 | 31 | 34 | 7,265 | 2,096 |
| ASIA | | | | | | | | | |
| India | 3,818,080 | 3,216,200 | 3,331,000 | 3,124,000 | 19,870 | 17,624 | 13,920 | 12,880 | |
| Japanese Empire: | 12,139 | 49,911 | 12,778 | | 498 | 304 | 77 | 61,242 | 19,327 |
| Chosen | 3,000 | 3,386 | 3,905 | 3,987 | | | | 1,141 | 1,185 |
| Total Northern Hemisphere countries reporting all years | 8,211,751 | 6,881,776 | 7,504,084 | 7,466,532 | 57,532 | 46,886 | 51,881 | 37,850 | 331,833 |
| Estimated Northern Hemisphere total | 11,648,000 | 10,030,000 | 12,195,000 | 11,994,000 | 78,666 | 64,159 | 77,332 | 1,264,900 | 1,277,600 |
| SOUTHERN HEMISPHERE | | | | | | | | | |
| Chile | 4,748 | 913 | | | 19 | 16 | | 4,734 | |
| Uruguay | 4,126,526 | 116,279 | 175,493 | 203,517 | 4,951 | 1,198 | 1,954 | 2,284 | |
| Argentina | 4,113,434 | 5,224,757 | 7,055,000 | 7,297,000 | 31,117 | 52,865 | 79,444 | 82,791 | |
| Australia | 1,056 | 394 | | | 9 | 4 | | 55,627 | 33 |
| New Zealand | 6,2565 | 8,693 | 5,213 | | (40) | 121 | 63 | 1,255,100 | 1,111,700 |
| Total Southern Hemisphere countries reporting all years | 4,239,962 | 5,341,036 | 7,230,493 | 7,500,517 | 31,117 | 52,365 | 79,444 | 93,486 | 323,601 |
| Total Northern Hemisphere and Southern Hemisphere countries reporting all years | 12,451,713 | 12,222,812 | 14,735,177 | 14,778,522 | 88,649 | 99,251 | 131,325 | 125,086 | 331,833 |
| Estimated world total | 15,892,000 | 15,381,000 | 19,265,000 | 19,479,000 | 110,802 | 117,803 | 156,751 | 152,810 | 1,277,600 |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Estimates given are for crops harvested during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

1 Where changes in territory have occurred averages are estimates for territory within present boundaries.

2 Flax and hemp.

3 3-year average.

4 4-year average.

5 2-year average.

6 1 year only, 1910.

7 Average 1915-1918.

8 1 year only, 1912.

9 Acreage figures are for area sown; figures of area harvested are not available for all years but over a 16-year period the harvested area averaged 10 per cent below the sown area.

10 Excludes a few minor producing countries for which no statistics are available and which do not enter into world trade. No figures are included for Germany, whose acreage in 1913 was 37,800 acres and has now fallen from 113,000 acres in 1921 to 86,000 acres in 1928. No production figures are available.

TABLE 94.—*Flaxseed: Yield per acre and estimated price per bushel, December 1, by States, averages, and annual, 1924-1929*

| State | Yield per acre | | | | | | | Estimated price per bushel | | | | | | |
|--------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Av., 1918- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Av., 1923- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| Wisconsin..... | 12.0 | 13.0 | 13.8 | 12.0 | 13.2 | 13.5 | 12.0 | 210 | 225 | 226 | 200 | 190 | 199 | 270 |
| Minnesota..... | 9.8 | 11.4 | 10.0 | 9.4 | 9.7 | 8.0 | 9.0 | 213 | 233 | 230 | 197 | 192 | 205 | 287 |
| Iowa..... | 10.5 | 11.7 | 10.5 | 11.6 | 12.0 | 10.4 | 11.3 | 209 | 225 | 220 | 195 | 195 | 198 | 275 |
| Missouri..... | 7.8 | 9.0 | 7.5 | 8.0 | 6.5 | 8.0 | 6.0 | 200 | 225 | 190 | 195 | 188 | 190 | 265 |
| North Dakota..... | 7.0 | 8.5 | 6.5 | 5.5 | 8.2 | 7.3 | 4.7 | 208 | 227 | 226 | 193 | 184 | 201 | 287 |
| South Dakota..... | 8.2 | 8.6 | 6.8 | 5.8 | 10.0 | 6.5 | 5.9 | 206 | 223 | 225 | 190 | 185 | 201 | 280 |
| Nebraska..... | 8.5 | 7.0 | 9.0 | 8.7 | 10.0 | 8.0 | 7.6 | 205 | 225 | 230 | 185 | 175 | 190 | 280 |
| Kansas..... | 6.4 | 6.5 | 6.8 | 6.9 | 5.5 | 6.9 | 5.9 | 203 | 215 | 200 | 200 | 185 | 185 | 234 |
| Montana..... | 5.5 | 8.7 | 4.5 | 4.2 | 10.2 | 8.5 | 3.2 | 199 | 221 | 220 | 185 | 175 | 192 | 280 |
| Wyoming..... | | | | | | 7.0 | 5.0 | | | | | | 195 | 275 |
| United States..... | 7.5 | 9.1 | 7.3 | 6.7 | 9.1 | 7.4 | 5.6 | 208.9 | 227.4 | 226.5 | 194.0 | 186.0 | 201.2 | 284.3 |

Bureau of Agricultural Economics. Estimates of crop-reporting board.

14-year average.

TABLE 95.—*Flaxseed: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917-1928*

| Year beginning July | Percentage of year's receipts | | | | | | | | | | | | |
|------------------------|-------------------------------|------|-------|------|------|------|------|------|------|------|-----|------|--------|
| | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Season |
| 1917..... | 1.8 | 3.6 | 21.5 | 28.1 | 17.6 | 7.6 | 4.7 | 4.0 | 4.8 | 1.8 | 1.6 | 2.9 | 100.0 |
| 1918..... | 1.8 | 2.9 | 14.8 | 21.5 | 15.0 | 10.9 | 5.2 | 4.4 | 5.8 | 4.3 | 5.0 | 8.4 | 100.0 |
| 1919..... | 3.6 | 8.0 | 20.6 | 22.2 | 11.1 | 7.4 | 5.0 | 6.3 | 3.1 | 3.1 | 2.6 | 7.0 | 100.0 |
| 1920..... | 2.1 | 4.7 | 23.6 | 28.6 | 13.0 | 6.2 | 5.0 | 3.3 | 3.1 | 2.1 | 3.4 | 4.9 | 100.0 |
| 1921..... | 6.4 | 10.9 | 20.7 | 25.7 | 12.0 | 6.9 | 4.3 | 2.8 | 3.0 | 2.4 | 2.1 | 2.8 | 100.0 |
| 1922..... | 2.5 | 13.4 | 27.6 | 23.3 | 11.4 | 5.9 | 4.7 | 3.0 | 2.7 | 2.3 | 1.6 | 1.6 | 100.0 |
| 1923..... | 1.1 | 10.0 | 30.7 | 27.3 | 12.1 | 6.0 | 2.6 | 2.3 | 2.0 | 1.5 | 2.1 | 2.3 | 100.0 |
| 1924..... | .5 | 5.3 | 23.0 | 34.5 | 17.8 | 6.7 | 3.8 | 2.7 | 1.8 | 1.4 | 1.2 | 1.3 | 100.0 |
| 1925..... | 1.1 | 11.1 | 34.3 | 23.5 | 12.4 | 5.6 | 2.7 | 2.0 | 1.8 | 1.5 | 1.9 | 2.1 | 100.0 |
| 1926..... | 1.4 | 12.0 | 25.5 | 32.5 | 11.2 | 6.3 | 2.4 | 2.3 | 1.7 | .9 | 1.7 | 2.1 | 100.0 |
| 1927..... | 1.0 | 6.1 | 32.9 | 33.4 | 10.5 | 5.3 | 3.0 | 1.9 | 1.9 | 1.2 | 1.7 | 1.1 | 100.0 |
| 1928..... | 1.1 | 7.2 | 31.1 | 35.3 | 11.6 | 5.3 | 2.1 | 1.2 | 1.4 | 1.0 | 1.5 | 1.2 | 100.0 |

Bureau of Agricultural Economics.

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TABLE 96.—*Flaxseed: Commercial stocks in store, 1926-27 to 1929-30*

DOMESTIC FLAXSEED IN UNITED STATES¹

| | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. |
|---------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| 1926-27 | | | | | 2,684 | 2,328 | 2,089 | 2,014 | 1,834 | 1,396 | 1,445 | 909 |
| 1927-28 | 584 | 1,583 | 5,353 | 4,703 | 4,247 | 3,542 | 2,816 | 2,178 | 1,691 | 882 | 781 | 615 |
| 1928-29 | 317 | 704 | 2,721 | 1,343 | 1,397 | 1,142 | 780 | 681 | 547 | 398 | 434 | 370 |
| 1929-30 | 159 | 924 | 1,179 | 610 | | | | | | | | |

CANADIAN FLAXSEED IN UNITED STATES¹

| 1926-27 | | | | | 14 | 14 | 17 | 17 | 17 | 57 | 11 | 13 |
|---------|---|---|---|----|----|----|----|----|----|----|----|----|
| 1927-28 | 0 | 0 | 1 | 12 | 17 | 18 | 18 | 0 | 0 | 0 | 0 | 1 |
| 1928-29 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1929-30 | 0 | 0 | 0 | 0 | | | | | | | | |

Bureau of Agricultural Economics. Compiled from weekly reports to the Grain, Hay, and Feed Market News Service. Data are for stocks on the Saturday nearest the 1st day of the month.

¹ Includes flaxseed in store in public and private elevators in 39 important markets and also the flaxseed afloat in vessels or barges in the harbors of lake and seaboard ports. Flaxseed in transit either by rail or water, mill stocks, or small private stocks of flaxseed intended only for local purposes, not included.

² Includes flaxseed stored at lake and seaboard ports, exclusive of flaxseed in transit on lakes and canals.

TABLE 97.—*Flaxseed: Receipts at Minneapolis, 1909-1929*

| Year beginning September | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Total |
|-----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> |
| 1909 | 999 | 2,219 | 1,892 | 601 | 966 | 670 | 826 | 437 | 222 | 159 | 123 | 137 | 9,251 |
| 1910 | 854 | 1,530 | 1,292 | 535 | 338 | 300 | 232 | 112 | 118 | 122 | 133 | 191 | 5,757 |
| 1911 | 563 | 1,212 | 1,570 | 1,716 | 531 | 459 | 397 | 468 | 571 | 440 | 487 | 160 | 8,574 |
| 1912 | 700 | 1,657 | 1,520 | 2,245 | 1,450 | 1,246 | 1,057 | 742 | 518 | 514 | 432 | 281 | 12,362 |
| 1913 | 756 | 1,686 | 1,505 | 1,131 | 711 | 478 | 592 | 270 | 139 | 165 | 233 | 117 | 7,783 |
| 1914 | 901 | 1,890 | 1,247 | 1,016 | 599 | 443 | 384 | 142 | 77 | 146 | 239 | 115 | 7,199 |
| 1915 | 347 | 1,038 | 1,506 | 1,113 | 319 | 399 | 810 | 486 | 440 | 363 | 441 | 199 | 7,461 |
| 1916 | 316 | 2,380 | 1,694 | 1,045 | 544 | 442 | 441 | 384 | 263 | 565 | 325 | 92 | 8,491 |
| 1917 | 265 | 980 | 1,112 | 614 | 533 | 553 | 527 | 283 | 349 | 048 | 208 | 94 | 6,166 |
| 1918 | 536 | 915 | 857 | 788 | 558 | 473 | 829 | 439 | 436 | 942 | 642 | 196 | 7,611 |
| 1919 | 753 | 570 | 568 | 492 | 344 | 368 | 409 | 159 | 295 | 522 | 554 | 297 | 5,331 |
| 1920 | 580 | 1,444 | 861 | 699 | 298 | 269 | 364 | 434 | 578 | 572 | 338 | 289 | 6,726 |
| 1921 | 500 | 1,144 | 375 | 354 | 308 | 200 | 254 | 196 | 300 | 220 | 157 | 288 | 4,296 |
| 1922 | 909 | 1,121 | 580 | 577 | 447 | 249 | 319 | 476 | 401 | 481 | 359 | 1,019 | 6,638 |
| 1923 | 2,654 | 1,953 | 1,308 | 877 | 358 | 250 | 229 | 210 | 296 | 296 | 264 | 269 | 8,964 |
| 1924 | 2,265 | 3,475 | 2,781 | 1,375 | 1,244 | 750 | 671 | 374 | 402 | 442 | 286 | 1,094 | 15,159 |
| 1925 | 3,331 | 2,745 | 1,107 | 722 | 375 | 276 | 320 | 357 | 431 | 360 | 294 | 830 | 11,148 |
| 1926 | 1,539 | 2,906 | 1,103 | 669 | 415 | 318 | 273 | 169 | 257 | 277 | 145 | 441 | 8,511 |
| 1927 | 4,465 | 3,894 | 1,065 | 490 | 716 | 495 | 471 | 311 | 439 | 457 | 143 | 652 | 13,598 |
| 1928 ¹ | 3,454 | 3,690 | 1,278 | 601 | 373 | 328 | 328 | 255 | 244 | 314 | 180 | 1,249 | 12,294 |
| 1929 ¹ | 2,939 | 1,759 | 868 | 403 | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from annual reports of the Minneapolis Chamber of Commerce.

¹ Beginning January, 1929, figures are from the Minneapolis Daily Market Record, and are subject to revision.

TABLE 98.—*Linseed oil: Flaxseed used in production of oil, and quantity of oil produced, United States, 1919-1928*

| Year beginning Oct. 1 | Flaxseed crushed | | | | |
|-----------------------|------------------|---------------|---------------|----------------|---------------|
| | October-December | January-March | April-June | July-September | Total |
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1919 | 7,084 | 6,336 | 6,407 | 6,542 | 26,969 |
| 1920 | 6,341 | 6,343 | 6,332 | 5,812 | 24,828 |
| 1921 | 7,539 | 6,713 | 3,111 | 5,583 | 23,276 |
| 1922 | 8,602 | 8,292 | 8,680 | 8,223 | 33,806 |
| 1923 | 8,970 | 9,575 | 9,434 | 7,550 | 35,529 |
| 1924 | 11,530 | 12,516 | 9,129 | 7,822 | 40,996 |
| 1925 | 11,708 | 10,651 | 7,767 | 9,500 | 39,716 |
| 1926 | 11,085 | 11,037 | 8,963 | 9,051 | 40,136 |
| 1927 | 12,609 | 11,885 | 9,608 | 7,603 | 41,795 |
| 1928 (preliminary) | 11,191 | 10,723 | 9,816 | 10,166 | 41,896 |

| | Oil produced | | | | |
|--------------------|--------------|--------------|--------------|--------------|--------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1919 | 139,960 | 117,226 | 121,407 | 126,138 | 504,731 |
| 1920 | 120,502 | 118,787 | 118,887 | 107,716 | 465,892 |
| 1921 | 137,528 | 121,941 | 70,239 | 102,581 | 435,289 |
| 1922 | 158,753 | 155,148 | 178,267 | 154,588 | 646,756 |
| 1923 | 165,560 | 177,583 | 176,187 | 139,862 | 659,192 |
| 1924 | 211,954 | 229,541 | 169,980 | 146,306 | 757,784 |
| 1925 | 217,992 | 191,607 | 144,950 | 174,057 | 731,606 |
| 1926 | 206,496 | 202,162 | 167,232 | 169,274 | 745,164 |
| 1927 | 238,046 | 223,751 | 179,532 | 141,880 | 783,218 |
| 1928 (preliminary) | 206,273 | 200,123 | 184,083 | 188,769 | 779,255 |

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census, "Animal and vegetable fats and oils."

TABLE 99.—*Flaxseed: Estimated average price per bushel, received by producers, United States, 1909-1929*

| Year beginning September | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Weighted average |
|--------------------------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|---------|------------------|
| 1909 | 123.0 | 131.3 | 148.4 | 182.0 | 182.0 | 193.0 | 193.5 | 201.7 | 202.5 | 189.5 | 196.6 | 214.8 | 148.6 |
| 1910 | 227.2 | 231.8 | 230.6 | 226.4 | 227.5 | 237.3 | 237.6 | 238.2 | 233.4 | 215.3 | 202.4 | 201.4 | 229.8 |
| 1911 | 204.3 | 207.8 | 196.4 | 184.6 | 189.0 | 187.4 | 187.6 | 180.2 | 183.0 | 201.7 | 186.8 | 168.9 | 195.8 |
| 1912 | 155.2 | 140.6 | 124.0 | 110.4 | 107.8 | 114.2 | 116.3 | 114.0 | 115.0 | 114.6 | 116.0 | 123.2 | 127.4 |
| 1913 | 125.2 | 120.6 | 119.3 | 122.0 | 126.0 | 130.2 | 132.6 | 133.8 | 135.8 | 136.4 | 143.4 | 145.0 | 123.9 |
| 1914 | 133.4 | 123.0 | 122.4 | 130.4 | 149.2 | 160.8 | 162.8 | 168.6 | 169.6 | 161.0 | 118.6 | 144.0 | 131.6 |
| 1915 | 145.8 | 155.5 | 108.4 | 180.0 | 198.4 | 206.7 | 202.3 | 197.0 | 184.2 | 189.8 | 170.0 | 184.2 | 169.6 |
| 1916 | 194.7 | 217.0 | 241.6 | 249.0 | 252.2 | 253.4 | 259.6 | 283.4 | 269.7 | 288.4 | 274.8 | 287.2 | 233.8 |
| 1917 | 305.6 | 302.2 | 296.2 | 303.7 | 318.8 | 338.2 | 364.8 | 376.5 | 368.4 | 356.4 | 379.9 | 395.9 | 315.9 |
| 1918 | 381.0 | 357.4 | 337.0 | 333.9 | 318.9 | 318.8 | 338.0 | 355.0 | 375.4 | 410.7 | 492.4 | 529.0 | 374.2 |
| 1919 | 477.8 | 410.2 | 410.3 | 436.0 | 445.0 | 464.6 | 464.2 | 452.0 | 434.6 | 390.4 | 331.6 | 297.0 | 427.0 |
| 1920 | 285.0 | 259.9 | 208.4 | 170.2 | 160.0 | 153.4 | 146.5 | 134.2 | 135.7 | 145.8 | 154.0 | 163.4 | 217.6 |
| 1921 | 164.8 | 164.0 | 145.0 | 148.1 | 162.1 | 194.0 | 217.4 | 224.6 | 223.8 | 230.0 | 217.2 | 208.8 | 171.0 |
| 1922 | 189.1 | 199.4 | 211.0 | 217.8 | 229.9 | 245.4 | 261.6 | 279.5 | 273.1 | 248.4 | 228.8 | 210.4 | 200.5 |
| 1923 | 208.4 | 212.1 | 211.4 | 218.8 | 218.8 | 224.0 | 223.7 | 217.7 | 222.6 | 213.1 | 218.1 | 210.2 | 212.3 |
| 1924 | 201.2 | 210.8 | 222.7 | 235.8 | 271.8 | 275.3 | 267.8 | 244.7 | 251.8 | 246.8 | 227.6 | 229.5 | 220.7 |
| 1925 | 227.9 | 228.9 | 228.1 | 232.1 | 224.5 | 216.4 | 202.9 | 207.0 | 205.4 | 203.9 | 208.7 | 215.7 | 224.6 |
| 1926 | 211.3 | 197.5 | 195.5 | 196.4 | 193.0 | 195.7 | 195.1 | 196.1 | 205.7 | 204.7 | 198.4 | 203.7 | 205.8 |
| 1927 | 197.1 | 191.2 | 184.2 | 185.3 | 188.4 | 189.9 | 194.8 | 198.4 | 210.5 | 209.0 | 195.5 | 181.7 | 192.0 |
| 1928 | 181.6 | 198.1 | 198.1 | 205.4 | 211.1 | 218.4 | 219.2 | 216.4 | 214.7 | 217.0 | 233.2 | 259.5 | 205.5 |
| 1929 | 285.4 | 300.5 | 285.1 | 287.7 | | | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of flaxseed for each State; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices on 1st of month and 1st of succeeding month, September, 1909-December, 1923.

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TABLE 100.—*Flaxseed: International trade, average 1911-1913, annual 1925-1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|-------------------------------|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|---------------|
| | Average, 1911-1913 | | 1925 | | 1926 | | 1927 | | 1928 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| PRINCIPAL EXPORTING COUNTRIES | | | | | | | | | | |
| Argentina..... | 1 | 25,562 | 0 | 37,821 | 1 | 65,866 | 0 | 74,585 | 0 | 76,547 |
| British India..... | 1 325 | 14,409 | 517 | 14,246 | 823 | 7,455 | 968 | 8,670 | 1 632 | 6,835 |
| Canada..... | 89 | 10,645 | 0 | 5,502 | 810 | 2,653 | 354 | 2,185 | 300 | 2,950 |
| Uruguay..... | 0 | 994 | 0 | 1,474 | 0 | 2,093 | 0 | 2,274 | 0 | 2,379 |
| Russia..... | 80 | 5,739 | 30 | 1,958 | 40 | 1,833 | 40 | 1,944 | 0 | 2,379 |
| Lithuania..... | 0 | 0 | 0 | 810 | 0 | 1,014 | 0 | 985 | 0 | 275 |
| Latvia..... | 0 | 0 | 576 | 989 | 324 | 672 | 512 | 577 | 699 | 379 |
| Morocco..... | 0 | 338 | 0 | 304 | 0 | 296 | 0 | 476 | 0 | 178 |
| Eritrea ¹ | 0 | 0 | 1 | 379 | 0 | 258 | 0 | 178 | 0 | 178 |
| China..... | 0 | 648 | 0 | 199 | 0 | 155 | 0 | 221 | 0 | 221 |
| Poland..... | 0 | 0 | 145 | 370 | 244 | 56 | 552 | 611 | 851 | 317 |
| Estonia..... | 0 | 0 | 11 | 36 | 0 | 196 | 24 | 69 | 76 | 12 |
| Tunis..... | 0 | 39 | 0 | 53 | 0 | 31 | 0 | 46 | 0 | 64 |
| Rumania..... | 19 | 120 | 1 | 25 | 0 | 100 | 30 | 107 | 0 | 0 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United States..... | 7,298 | 101 | 16,510 | 0 | 22,550 | 0 | 21,821 | 0 | 17,579 | 0 |
| United Kingdom..... | 15,908 | 0 | 13,521 | 0 | 14,324 | 0 | 14,104 | 0 | 13,863 | 0 |
| Netherlands..... | 8,741 | 2,488 | 10,221 | 232 | 12,927 | 231 | 14,372 | 148 | 16,481 | 104 |
| France..... | 6,304 | 60 | 5,907 | 20 | 7,115 | 20 | 7,081 | 18 | 8,271 | 15 |
| Germany..... | 15,312 | 210 | 9,871 | 66 | 12,545 | 50 | 15,715 | 67 | 17,139 | 67 |
| Belgium..... | 9,313 | 5,965 | 3,153 | 284 | 3,662 | 300 | 3,937 | 219 | 5,007 | 325 |
| Italy..... | 1,698 | 1 | 1,836 | 2 | 2,272 | 1 | 2,878 | 0 | 2,633 | 0 |
| Sweden..... | 1,911 | 7 | 1,335 | 0 | 1,547 | 0 | 1,467 | 0 | 1,652 | 0 |
| Australia..... | 103 | 0 | 863 | 30 | 801 | 30 | 825 | 30 | 857 | 0 |
| Denmark..... | 1 | 0 | 574 | 0 | 916 | 0 | 557 | 0 | 956 | 7 |
| Czechoslovakia..... | 0 | 0 | 608 | 11 | 761 | 11 | 930 | 2 | 648 | 0 |
| Norway..... | 445 | 0 | 597 | 0 | 613 | 0 | 572 | 0 | 648 | 0 |
| Spain..... | 0 | 0 | 516 | 0 | 613 | 0 | 0 | 0 | 676 | 0 |
| Japan..... | 427 | 4 27 | 362 | 0 | 288 | 1 | 368 | 0 | 212 | 0 |
| Finland..... | 110 | 0 | 192 | 0 | 165 | 0 | 197 | 0 | 118 | 26 |
| Hungary..... | 0 | 0 | 31 | 8 | 82 | 10 | 101 | 12 | 14 | 0 |
| Austria..... | 1 1,913 | 3 41 | 2 23 | 3 0 | 10 | 0 | 13 | 0 | 14 | 0 |
| Total, 31 countries..... | 68,596 | 67,394 | 67,431 | 64,789 | 83,423 | 83,302 | 87,343 | 90,991 | 89,024 | 90,363 |

Bureau of Agricultural Economics. Official sources except where otherwise noted.

¹ 2-year average.

² Sea trade only.

³ International Yearbook of Agricultural Statistics.

⁴ 1 year only.

⁵ Average for Austria-Hungary.

TABLE 101.—*Flaxseed, No. 1: Average price per bushel, Minneapolis, 1909-1929*

| Year beginning September | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Average |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1909..... | 141 | 157 | 175 | 193 | 218 | 218 | 225 | 238 | 222 | 204 | 234 | 247 | 206 |
| 1910..... | 206 | 262 | 261 | 242 | 260 | 268 | 260 | 256 | 247 | 224 | 210 | 234 | 249 |
| 1911..... | 247 | 235 | 204 | 206 | 215 | 206 | 206 | 215 | 223 | 225 | 197 | 186 | 214 |
| 1912..... | 176 | 160 | 136 | 125 | 129 | 134 | 126 | 129 | 130 | 131 | 138 | 147 | 138 |
| 1913..... | 145 | 138 | 135 | 144 | 149 | 153 | 158 | 154 | 150 | 159 | 168 | 164 | 152 |
| 1914..... | 151 | 133 | 145 | 154 | 183 | 186 | 191 | 193 | 195 | 176 | 167 | 167 | 170 |
| 1915..... | 170 | 186 | 190 | 207 | 231 | 232 | 227 | 213 | 196 | 180 | 196 | 215 | 204 |
| 1916..... | 211 | 254 | 278 | 284 | 289 | 281 | 290 | 318 | 333 | 311 | 301 | 346 | 291 |
| 1917..... | 338 | 316 | 320 | 340 | 360 | 374 | 408 | 409 | 393 | 386 | 440 | 439 | 378 |
| 1918..... | 409 | 350 | 377 | 354 | 341 | 345 | 375 | 388 | 412 | 486 | 594 | 587 | 419 |
| 1919..... | 492 | 432 | 483 | 496 | 512 | 500 | 502 | 468 | 453 | 392 | 348 | 328 | 452 |
| 1920..... | 328 | 283 | 227 | 206 | 196 | 182 | 178 | 158 | 184 | 186 | 189 | 201 | 209 |
| 1921..... | 208 | 181 | 181 | 189 | 213 | 246 | 257 | 270 | 280 | 250 | 259 | 229 | 219 |
| 1922..... | 228 | 238 | 248 | 262 | 280 | 304 | 307 | 340 | 294 | 280 | 270 | 234 | 258 |
| 1923..... | 238 | 248 | 242 | 246 | 250 | 256 | 240 | 247 | 246 | 244 | 247 | 244 | 244 |
| 1924..... | 226 | 240 | 258 | 284 | 315 | 312 | 297 | 279 | 280 | 268 | 249 | 254 | 263 |
| 1925..... | 259 | 258 | 256 | 261 | 250 | 243 | 232 | 234 | 230 | 233 | 244 | 238 | 252 |
| 1926..... | 233 | 221 | 222 | 224 | 223 | 225 | 222 | 224 | 234 | 225 | 223 | 222 | 224 |
| 1927..... | 221 | 213 | 213 | 215 | 224 | 227 | 233 | 236 | 246 | 238 | 221 | 205 | 220 |
| 1928..... | 209 | 228 | 235 | 239 | 245 | 255 | 249 | 245 | 215 | 248 | 276 | 279 | 233 |
| 1929..... | 328 | 332 | 324 | 322 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. The figures shown for 1909-1920 are averages of daily closing prices compiled from annual reports of the Minneapolis Chamber of Commerce; 1921 to date are averages of daily prices weighted by car-lot sales, compiled from Minneapolis Daily Market Record. Data 1899-1906 available in 1924 Yearbook, p. 646, Table 125.

TABLE 102.—*Linseed oil: International trade, average 1909–1913, annual 1925–1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|-------------------------------|---------------------|--------------------|--------------|------------------|--------------------|-----------------|--------------|-----------------|--------------------|--------------|
| | Average 1909–1913 | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Netherlands | 457 | 73,634 | 164 | 146,519 | 914 | 164,911 | 579 | 150,621 | 1,187 | 155,926 |
| United Kingdom | 58,018 | 58,013 | 38,407 | 56,786 | 31,924 | 51,336 | 47,815 | 44,628 | 50,434 | 49,327 |
| Belgium | 10,233 | 26,790 | 1,659 | 27,101 | 4,054 | 15,114 | 759 | 21,009 | 2,125 | 24,465 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| Germany | 5,231 | 4,377 | 58,779 | 4,869 | 41,826 | 6,701 | 44,057 | 5,525 | 29,188 | 10,342 |
| United States | 2,605 | 4,105 | 13,607 | 2,487 | 15,041 | 2,567 | 946 | 2,525 | 173 | 1,905 |
| France | 3,382 | 10,931 | 9,250 | 3,311 | 15,480 | 4,121 | 6,159 | 4,783 | 7,636 | 5,242 |
| Switzerland | 7,825 | 16 | 11,047 | 5 | 13,033 | 25 | 14,234 | 4 | 14,771 | 73 |
| Brazil | 8,726 | 0 | 11,724 | 0 | 10,285 | 0 | | | | |
| Austria | ¹ 16,367 | ¹ 6,542 | 7,635 | ² 347 | 8,807 | 437 | 8,956 | 591 | 10,455 | 510 |
| Australia ² | ² 12,252 | ² 0 | 6,247 | 42 | 5,802 | 36 | 4,575 | 10 | | |
| Finland | 812 | 0 | 4,490 | 0 | 5,154 | 0 | 5,954 | 0 | 6,507 | 0 |
| Union of South Africa | 3,449 | 0 | 4,122 | 0 | 4,804 | 0 | 4,259 | 0 | 5,082 | 0 |
| Egypt | 3,647 | 0 | 4,901 | 3 | 5,211 | 4 | 4,825 | 2 | 5,054 | 0 |
| Dutch East Indies | ³ 3,199 | 0 | 4,831 | 0 | 4,683 | 0 | 5,034 | 0 | ³ 3,511 | 0 |
| New Zealand | 4,188 | 0 | 3,673 | 7 | 5,216 | 5 | 2,869 | 0 | 3,667 | 0 |
| Hungary | 0 | 0 | 3,757 | 53 | 3,841 | 16 | 6,398 | 15 | 5,704 | 1 |
| Norway | 1,609 | ² 31 | 2,328 | ² 6 | 3,591 | ² 27 | 3,148 | ² 17 | 3,191 | |
| Italy | 1,042 | 165 | 1,139 | 460 | 1,604 | 400 | 4,227 | 427 | 7,441 | 358 |
| Chile | 2,854 | 15 | 2,113 | 0 | ² 2,802 | ² 0 | | | | |
| British India | 3,430 | 1,967 | 2,139 | 842 | 2,168 | 414 | 1,885 | 547 | 2,392 | 676 |
| Yugoslavia | ² 6,445 | ² 0 | 2,393 | 27 | 57 | 188 | 1,788 | 7 | 1,633 | 31 |
| Czechoslovakia | 0 | 0 | 2,032 | 72 | 2,227 | 6 | 1,098 | 40 | 811 | 11 |
| Canada | 2,279 | 0 | 341 | 66 | 937 | 56 | 738 | 53 | 734 | 53 |
| Denmark | | | 2,110 | 112 | 1,675 | 30 | 1,972 | 314 | 2,379 | 1,198 |
| Philippine Islands | 869 | 0 | 748 | 0 | 952 | 0 | 1,155 | 0 | | |
| Greece | 246 | 0 | 743 | ² 161 | 312 | 0 | 280 | 0 | 453 | |
| Argentina | 886 | ² 5 | 1,015 | 503 | 715 | 391 | 587 | 238 | | |
| Sweden | 933 | 5 | 387 | 937 | 905 | 1,019 | 560 | 1,189 | 580 | 1,436 |
| Total, 28 countries | 154,924 | 186,593 | 201,781 | 244,716 | 194,020 | 247,804 | 174,857 | 232,545 | 165,108 | 251,514 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. Conversions made on the basis of 7.5 pounds to the gallon.

¹ Average for Austria-Hungary.

² International Yearbook of Agricultural Statistics.

³ From original source.

⁴ 2-year average.

⁵ Java and Madura only.

⁶ 4-year average.

TABLE 103.—*Linseed oil, raw: Average car-lot price per gallon in barrels, New York, 1910–1929*

| Year beginning September | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Average |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1910 | 90 | 90 | 95 | 95 | 95 | 96 | 96 | 91 | 91 | 89 | 87 | 80 | 91 |
| 1911 | 87 | 88 | 84 | 71 | 74 | 71 | 70 | 73 | 73 | 76 | 77 | 66 | 76 |
| 1912 | 66 | 62 | 56 | 43 | 42 | 46 | 45 | 44 | 46 | 45 | 47 | 49 | 49 |
| 1913 | 50 | 47 | 40 | 48 | 48 | 48 | 50 | 51 | 50 | 50 | 52 | 59 | 50 |
| 1914 | 57 | 49 | 44 | 45 | 48 | 56 | 55 | 58 | 62 | 63 | 54 | 50 | 53 |
| 1915 | 52 | 55 | 60 | 61 | 66 | 72 | 77 | 76 | 75 | 67 | 63 | 71 | 66 |
| 1916 | 70 | 82 | 90 | 92 | 94 | 95 | 94 | 107 | 121 | 121 | 112 | 118 | 100 |
| 1917 | 125 | 118 | 115 | 121 | 129 | 129 | 141 | 157 | 157 | 157 | 164 | 188 | 142 |
| 1918 | 190 | 183 | 155 | 158 | 150 | 145 | 148 | 154 | 161 | 181 | 210 | 222 | 171 |
| 1919 | 204 | 179 | 175 | 182 | 177 | 177 | 180 | 183 | 169 | 165 | 152 | 141 | 174 |
| 1920 | 122 | 120 | 98 | 82 | 78 | 66 | 66 | 61 | 70 | 75 | 75 | 74 | 82 |
| 1921 | 74 | 68 | 67 | 67 | 72 | 82 | 82 | 84 | 90 | 84 | 89 | 87 | 79 |
| 1922 | 88 | 89 | 88 | 89 | 89 | 95 | 102 | 110 | 115 | 112 | 104 | 97 | 99 |
| 1923 | 90 | 94 | 92 | 92 | 92 | 91 | 93 | 90 | 94 | 94 | 98 | 102 | 94 |
| 1924 | 102 | 102 | 108 | 110 | 117 | 116 | 111 | 104 | 105 | 106 | 98 | 102 | 107 |
| 1925 | 103 | 199 | 90 | 95 | 87 | 85 | 80 | 81 | 81 | 84 | 89 | 90 | 89 |
| 1926 | 83 | 81 | 81 | 80 | 79 | 78 | 77 | 81 | 84 | 84 | 80 | 80 | 81 |
| 1927 | 77 | 74 | 73 | 72 | 74 | 74 | 74 | 74 | 78 | 77 | 75 | 73 | 75 |
| 1928 | 74 | 76 | 77 | 75 | 75 | 76 | 76 | 76 | 77 | 79 | 92 | 96 | 79 |
| 1929 | 116 | 118 | 111 | 110 | | | | | | | | | |

Bureau of Agricultural Economics. Figures for 1910–1915 from Monthly Labor Review; 1916–1918 from War Industries Board Price Bulletin; 1919–1928 from Oil, Paint, and Drug Reporter, average of weekly range.

¹ Beginning October, 1925, prices were quoted on pound basis and have been converted to price per gallon by multiplying by 7.5.

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TABLE 104.—*Linseed meal: Average wholesale price per ton, Minneapolis, 1909–1929*

| Year beginning September | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Average |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1909 | 32.00 | 31.20 | 32.60 | 33.38 | 35.14 | 35.50 | 35.06 | 34.50 | 34.50 | 30.17 | 31.38 | 33.04 | 33.21 |
| 1910 | 33.50 | 33.04 | 32.15 | 32.77 | 33.90 | 34.45 | 32.48 | 31.13 | 32.00 | 32.00 | 32.00 | 35.24 | 32.89 |
| 1911 | 36.64 | 37.00 | 35.84 | 36.69 | 38.00 | 37.80 | 36.67 | 34.83 | 34.00 | 33.08 | 33.00 | 33.00 | 35.55 |
| 1912 | 33.00 | 31.89 | 31.22 | 29.26 | 28.73 | 28.36 | 27.04 | 26.15 | 25.50 | 25.50 | 25.98 | 30.75 | 28.02 |
| 1913 | 32.00 | 31.26 | 29.25 | 29.00 | 29.96 | 30.25 | 28.73 | 29.00 | 29.42 | 30.73 | 31.50 | 31.50 | 30.22 |
| 1914 | 31.02 | 29.22 | 32.70 | 34.00 | 37.52 | 38.07 | 35.08 | 32.22 | 31.50 | 32.50 | 34.54 | 35.08 | 33.62 |
| 1915 | 37.50 | 37.50 | 36.86 | 37.56 | 37.38 | 37.00 | 34.31 | 32.12 | 29.27 | 30.18 | 32.25 | 34.50 | 34.70 |
| 1916 | 37.50 | 39.02 | 43.96 | 46.40 | 45.12 | 44.45 | 43.50 | 45.46 | 47.81 | 45.92 | 49.71 | 54.62 | 45.29 |
| 1917 | 56.07 | 57.50 | 56.22 | 59.98 | 57.60 | 57.75 | 59.17 | 60.00 | 59.46 | 57.28 | 57.62 | 59.00 | 58.20 |
| 1918 | 59.00 | 59.96 | 60.00 | 62.40 | 76.56 | 67.71 | 65.12 | 68.00 | 69.36 | 70.25 | 80.83 | 93.23 | 69.37 |
| 1919 | 85.29 | 76.21 | 79.22 | 84.40 | 84.58 | 82.59 | 79.00 | 72.48 | 70.58 | 68.24 | 68.00 | 67.04 | 76.47 |
| 1920 | 67.00 | 64.69 | 55.25 | 46.00 | 42.42 | 40.64 | 44.77 | 39.69 | 33.38 | 33.65 | 40.50 | 43.59 | 45.96 |
| 1921 | 42.84 | 39.08 | 41.38 | 47.00 | 48.00 | 50.86 | 55.81 | 54.38 | 53.23 | 51.00 | 48.28 | 46.44 | 48.19 |
| 1922 | 43.32 | 50.46 | 53.65 | 54.88 | 57.62 | 55.23 | 49.19 | 47.00 | 45.81 | 41.88 | 43.84 | 49.28 | 49.35 |
| 1923 | 52.21 | 52.78 | 50.92 | 49.76 | 49.31 | 45.74 | 45.10 | 43.20 | 42.58 | 44.44 | 47.16 | 48.73 | 47.66 |
| 1924 | 48.08 | 50.00 | 48.86 | 50.58 | 51.31 | 49.91 | 45.08 | 43.68 | 45.96 | 47.63 | 47.08 | 49.08 | 48.19 |
| 1925 | 47.78 | 46.96 | 47.35 | 48.72 | 50.09 | 52.70 | 50.37 | 52.44 | 53.60 | 50.69 | 50.80 | 49.54 | 50.09 |
| 1926 | 47.83 | 46.56 | 46.11 | 46.91 | 47.76 | 48.12 | 51.31 | 51.82 | 50.84 | 49.12 | 48.00 | 48.72 | 48.59 |
| 1927 | 49.50 | 48.46 | 48.00 | 48.00 | 50.92 | 52.00 | 53.30 | 54.06 | 57.44 | 55.33 | 52.82 | 49.17 | 51.58 |
| 1928 | 49.75 | 57.33 | 59.00 | 61.43 | 60.85 | 63.29 | 61.29 | 58.52 | 58.99 | 55.39 | 56.31 | 56.31 | 68.20 |
| 1929 | 59.57 | 60.00 | 59.31 | 58.66 | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record.

TABLE 105.—*Rice, rough: Acreage, production, value, exports, etc., United States, 1909–1929*

| Year | Acreage | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Foreign trade, mostly cleaned rice but including rice bran, meal, and broken rice, year beginning July 1 ¹ | | | |
|-------------------|-------------|------------------------|---------------|---|-------------------|---|--|---------------|---------------------------|
| | | | | | | Domestic exports | Shipments from United States to Alaska, Hawaii, and Porto Rico | Imports | Net balances ² |
| | 1,000 acres | Bushels of 46 lbs. | 1,000 bushels | Cents | 1,000 dollars | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1909 | 610 | 55.8 | 21,839 | | | | | | |
| 1909 | 610 | 33.8 | 20,607 | 79.5 | 16,392 | 964 | 4,276 | 8,114 | -2,581 |
| 1910 | 723 | 33.9 | 24,510 | 67.8 | 16,624 | 1,082 | 4,606 | 7,516 | -1,605 |
| 1911 | 696 | 32.9 | 22,934 | 79.7 | 18,274 | 1,420 | 4,890 | 6,842 | -157 |
| 1912 | 723 | 34.7 | 25,054 | 93.5 | 23,423 | 1,401 | 4,806 | 7,996 | -1,332 |
| 1913 | 827 | 31.1 | 25,744 | 85.8 | 22,090 | 807 | 5,244 | 10,447 | -3,756 |
| 1914 | 694 | 34.1 | 23,649 | 92.4 | 21,849 | 2,789 | 4,640 | 9,979 | -419 |
| 1915 | 803 | 36.1 | 28,947 | 90.6 | 26,212 | 4,391 | 5,191 | 9,516 | +2,651 |
| 1916 | 869 | 47.0 | 40,861 | 88.9 | 36,311 | 6,529 | 5,818 | 7,778 | +6,167 |
| 1917 | 981 | 35.4 | 34,739 | 189.6 | 65,879 | 7,069 | 4,878 | 16,418 | -1,148 |
| 1918 | 1,119 | 34.5 | 38,606 | 191.8 | 74,042 | 6,953 | 5,995 | 13,094 | +7,638 |
| 1919 | 911 | 58.8 | 55,351 | | | | | | |
| 1919 | 1,063 | 39.5 | 41,985 | 266.6 | 111,913 | 17,402 | 5,547 | 6,477 | +10,948 |
| 1920 | 1,336 | 39.0 | 52,066 | 119.1 | 62,036 | 15,871 | 6,014 | 3,485 | +21,217 |
| 1921 | 921 | 40.8 | 37,612 | 95.2 | 35,802 | 19,494 | 7,179 | 2,650 | +25,952 |
| 1922 | 1,055 | 39.2 | 41,405 | 93.1 | 38,562 | 13,344 | 8,290 | 2,503 | +20,308 |
| 1923 | 895 | 37.7 | 33,717 | 110.2 | 37,150 | 8,199 | 9,094 | 1,370 | +16,416 |
| 1924 | 744 | 59.7 | 49,686 | | | | | | |
| 1924 | 850 | 38.2 | 32,498 | 138.5 | 45,009 | 4,033 | 8,152 | 2,070 | +10,687 |
| 1925 | 889 | 37.5 | 33,309 | 153.8 | 51,232 | 1,734 | 8,040 | 4,747 | +5,635 |
| 1926 | 1,034 | 40.4 | 41,730 | 109.6 | 45,722 | 10,957 | 8,743 | 2,558 | +17,587 |
| 1927 | 1,012 | 44.2 | 44,774 | 92.9 | 41,616 | 11,152 | 9,183 | 1,588 | +19,035 |
| 1928 | 977 | 44.3 | 43,240 | 88.5 | 38,277 | 14,138 | 10,131 | 1,325 | +23,404 |
| 1929 ³ | 893 | 45.0 | 40,217 | 97.8 | 39,346 | | | | |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns. See 1927 Yearbook, page 819, for data for earlier years.

¹ Compiled from Commerce and Navigation of the United States, 1909–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1929, and official records of the Bureau of Foreign and Domestic Commerce.

² The difference between the total exports (domestic exports plus reexports plus shipments to Alaska, Hawaii, and Porto Rico) and total imports. Net exports indicated by +; net imports indicated by -.

³ Preliminary.

TABLE 106.—Rice: Acreage, yield per acre, and production in specified countries, average 1909-1913, 1921-1925, annual, 1927-1929

| Country | Acreage | | | | Yield per acre | | | | Production, in terms of cleaned rice | | | |
|--|--------------------|-------------|-------------|-------------------|--------------------|--------|--------|-------------------|--------------------------------------|------------------|------------------|-------------------|
| | Average, 1909-1913 | 1927 | 1928 | 1929, preliminary | Average, 1921-1925 | 1927 | 1928 | 1929, preliminary | Average, 1909-1913 | 1927 | 1928 | 1929, preliminary |
| NORTHERN HEMISPHERE | | | | | | | | | | | | |
| United States..... | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | Pounds | Pounds | Pounds | Pounds | 1,000,000 pounds | 1,000,000 pounds | 1,000,000 pounds | 1,000,000 pounds |
| Mexico..... | 716 | 922 | 977 | 883 | 1,076 | 1,229 | 1,251 | 1,251 | 660 | 1,244 | 1,201 | 1,117 |
| Hawaii..... | 1 06 | 1 10 | 1 12 | 1 18 | 1 515 | 1 883 | 1 000 | 1 000 | 1 34 | 100 | 118 | |
| Central and South America and West Indies: | | | | | | | | | 1 26 | 1 18 | | |
| Guatemala..... | | 6 | 4 | 3 | | | | | 1 2 | 3 | 2 | 2 |
| Salvador..... | | 13 | | | | | | | 1 17 | | | |
| Costa Rica..... | | 17 | 18 | | 1 294 | 278 | | | 1 5 | 5 | | |
| Colombia..... | | 15 | 41 | | 1 133 | 488 | | | 2 21 | 20 | | |
| Ecuador..... | | | | | | | | | 2 41 | | | |
| British Guiana..... | 36 | 44 | 50 | 56 | 1,500 | 1,500 | 1,446 | | 54 | 78 | 81 | |
| Dutch Guiana..... | | | 40 | | | 17 | 425 | | 2 | 15 | 17 | |
| Porto Rico..... | | | | | 1 250 | | | | 1 4 | 2 | | |
| Trinidad and Tobago..... | 1 16 | 1 8 | 7 | | | | | | 3 3 | 4 | | |
| Europe: | | | | | | | | | | | | |
| Spain..... | 94 | 115 | 120 | 120 | 3,191 | 3,270 | 3,508 | 3,450 | 300 | 421 | 395 | 414 |
| Portugal..... | 17 | 18 | 31 | | 1,353 | 1,278 | 1,598 | | 23 | 30 | | |
| Italy..... | 358 | 316 | 351 | 333 | 2,316 | 2,098 | 2,580 | 2,702 | 646 | 947 | 859 | 916 |
| Yugoslavia..... | 6 5 | 4 | 4 | 4 | 1,804 | | | | 3 | 3 | 3 | 3 |
| Bulgaria..... | 7 | 11 | 18 | 15 | | 1,000 | 1,278 | 1,400 | 9 | 18 | 23 | 21 |
| French West Africa: | | | | | | | | | | | | |
| French Guinea..... | | 2,008 | 2,100 | 1,977 | 487 | 648 | 551 | | 4 978 | 1,361 | 1,089 | |
| French Senegal..... | | 119 | 99 | 111 | 546 | 444 | 532 | | 65 | 44 | 59 | |
| Upper Volta..... | | 144 | 20 | | 3 136 | 150 | 3 | | 3 6 | 373 | 373 | |
| Sierra Leone..... | 7 260 | 390 | 400 | 400 | 7 828 | 797 | 932 | | 7 207 | 311 | | |
| Egypt..... | 287 | 192 | 436 | 265 | 2,132 | 1,336 | 1,661 | | 548 | 724 | | |
| Asia: | | | | | | | | | | | | |
| Turkey..... | 1 153 | 25 | | | 11,118 | 560 | | | 1 171 | 14 | | |
| India..... | 67,004 | 78,318 | 82,126 | | 863 | 808 | 864 | | 64,144 | 63,244 | 70,972 | |
| Andaman and Nicobar..... | | 3 | 4 | | | | | | 3 | 2 | 2 | |
| British North Borneo..... | | 62 | 69 | 71 | 7 594 | 870 | 577 | | 7 38 | 60 | 41 | |
| Brunei..... | | 3 | 2 | 4 | | | | | 4 2 | 1 | 3 | |
| French Establishments in India..... | | 45 | 44 | 47 | 644 | 614 | 574 | | 29 | 27 | 27 | |
| Japanese Empire: | | | | | | | | | | | | |
| Japan..... | 7,300 | 7,778 | 7,822 | 7,847 | 2,163 | 2,508 | 2,508 | 2,422 | 15,787 | 19,510 | 18,944 | 18,398 |
| Chosen (Korea)..... | 2,905 | 3,824 | 3,720 | 3,999 | 1,134 | 1,354 | 1,141 | 1,064 | 3,253 | 5,435 | 4,245 | 4,394 |
| Taiwan (Formosa)..... | 1,193 | 1,293 | 1,446 | 1,456 | 1,184 | 1,362 | 1,503 | 1,492 | 1,413 | 2,174 | 2,173 | |
| Kwantung..... | 1 | 4 | 2 | 2 | | | | | 1 | 4 | 4 | |

| | | | | | | | | |
|---|---------|--------|--------|-------|-------|---------|---------|---------|
| French Indo-China..... | 11,953 | 13,526 | 8,558 | 643 | 648 | 7,332 | 7,682 | 8,763 |
| Siam..... | 4,555 | 6,310 | 985 | 1,017 | 962 | 4,288 | 6,065 | 6,291 |
| Federated Malay States..... | 3,124 | 407 | 1,637 | 629 | 608 | 1,79 | 124 | 284 |
| United Federated Malay States..... | 93 | 72 | | 1,042 | | | 75 | |
| Straits Settlements..... | 2,817 | 4,229 | 431 | 1,649 | 698 | 1,213 | 2,744 | 3,082 |
| Philippine Islands..... | 695 | 835 | 587 | 589 | 653 | 408 | 471 | 545 |
| Ceylon..... | | | | | 638 | | | 532 |
| SOUTHERN HEMISPHERE | | | | | | | | |
| Brazil..... | 4,1,029 | 873 | | 966 | 1,283 | 190 | 1,025 | 1,120 |
| Argentina..... | 38 | 11 | | 1,312 | | 8 | 21 | 10 |
| Belgian Congo..... | 27 | 38 | | 222 | 211 | | 6 | |
| Madagascar..... | 1,009 | 1,483 | | 1,018 | 964 | 3,896 | 1,322 | 1,429 |
| Java and Madura: | | | | | | | | |
| Irrigated..... | 5,953 | 7,553 | 7,543 | 927 | 929 | 5,983 | 6,615 | 7,331 |
| Nonirrigated..... | 9,850 | 1,203 | 1,173 | 501 | 563 | 9,450 | 440 | 662 |
| Total, Java and Madura..... | 6,900 | 8,014 | 8,449 | 880 | 915 | 6,433 | 7,055 | 8,008 |
| Fiji Islands..... | 3,12 | 11 | | | | 23 | 7 | |
| Total, 8 countries reporting acres and production, all periods..... | 18,285 | 20,911 | 21,666 | 1,522 | 1,620 | 27,131 | 31,835 | 33,339 |
| Estimated world total, exclusive of China ¹⁰ | | | | | | 109,000 | 126,000 | 130,000 |

Bureau of Agricultural Economics. Official Sources and International Institute of Agriculture. Yields have not been calculated when total acreage is below 15,000 acres, Acreage and production data, in most cases, are for crops harvested in the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

¹¹ Year only.

¹² 2-year average.

¹³ 3-year average.

¹⁴ 4-year average.

¹⁵ Year 1915.

¹⁶ 5-year average.

¹⁷ Year 1914.

¹⁸ European Turkey included.

¹⁹ Rough estimate for nonirrigated rice.

²⁰ Unofficial estimates of the Chinese crops are as follows: 70,219,000,000 pounds in 1917; 52,738,000,000 pounds in 1920; and 50,056,000,000 pounds in 1923.

TABLE 107.—*Rice, rough: Acreage and production, by States, average 1923-1927, annual 1926-1929*

| State and division | Acreage | | | | | Production | | | | |
|---------------------------------------|---------------------------|----------------|----------------|----------------|-------------------|---------------------------|------------------|------------------|------------------|-------------------|
| | Average, 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ | Average, 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Missouri..... | 24 | 10 | | | 1 | 2 259 | 610 | 75 | 400 | 35 |
| South Carolina..... | 2 6 | 5 | | | | 2 109 | 85 | | | |
| Georgia..... | 2 3 | 3 | | | | 2 58 | 60 | | | |
| Mississippi..... | 2 1 | 1 | | | | 2 16 | 18 | | | |
| Arkansas..... | 170 | 199 | 175 | 164 | 154 | 7, 598 | 10, 547 | 7, 700 | 7, 823 | 7, 084 |
| Louisiana..... | 473 | 501 | 500 | 487 | 472 | 16, 481 | 16, 282 | 20, 000 | 18, 750 | 19, 352 |
| Texas..... | 160 | 166 | 174 | 184 | 171 | 6, 407 | 6, 142 | 8, 039 | 8, 006 | 7, 524 |
| United States, except California..... | 814 | 885 | 852 | 845 | 798 | 30, 849 | 33, 744 | 35, 814 | 35, 069 | 33, 995 |
| California..... | 122 | 149 | 160 | 132 | 95 | 6, 356 | 7, 986 | 8, 960 | 8, 171 | 6, 222 |
| United States..... | 936 | 1, 034 | 1, 012 | 977 | 893 | 37, 206 | 41, 730 | 44, 774 | 43, 240 | 40, 217 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.² 4-year average.TABLE 108.—*Rice, in terms of cleaned rice: World production, 1909-1929*

| Year | Estimated world production, exclusive of China | Production in chief producing countries ¹ | | | | | | | |
|-------------------------|--|--|------------------|------------------|------------------------------|-------------------|------------------|------------------|------------------|
| | | India | Japan | Indo-China | Java and Madura ² | Siam ³ | Chosen | Philippines | United States |
| | 1,000,000 pounds | 1,000,000 pounds | 1,000,000 pounds | 1,000,000 pounds | 1,000,000 pounds | 1,000,000 pounds | 1,000,000 pounds | 1,000,000 pounds | 1,000,000 pounds |
| 1909..... | 107, 000 | 63, 869 | 16, 474 | | 5, 723 | 3, 734 | 2, 343 | 1, 164 | 572 |
| 1910..... | 106, 000 | 64, 552 | 14, 650 | | 5, 738 | 3, 466 | 3, 269 | 1, 267 | 681 |
| 1911..... | 109, 000 | 63, 943 | 16, 246 | | 6, 170 | 4, 533 | 3, 634 | 717 | 637 |
| 1912..... | 109, 000 | 63, 802 | 15, 778 | 0, 614 | 5, 842 | 4, 561 | 3, 413 | 1, 512 | 696 |
| 1913..... | 113, 000 | 64, 555 | 15, 789 | 8, 051 | 6, 440 | 4, 994 | 3, 804 | 1, 404 | 715 |
| 1914..... | 113, 000 | 61, 109 | 17, 909 | 9, 521 | 6, 339 | 4, 708 | 4, 439 | 1, 100 | 657 |
| 1915..... | 124, 000 | 73, 315 | 17, 569 | 7, 921 | 6, 451 | 4, 786 | 4, 036 | 1, 289 | 804 |
| 1916..... | 129, 000 | 78, 521 | 18, 363 | 6, 733 | 6, 409 | 5, 011 | 4, 377 | 1, 745 | 1, 135 |
| 1917..... | 132, 000 | 80, 559 | 17, 143 | 6, 313 | 6, 742 | 5, 133 | 4, 261 | 2, 210 | 965 |
| 1918..... | 105, 000 | 54, 466 | 17, 184 | 0, 302 | 6, 831 | 4, 642 | 4, 765 | 2, 085 | 1, 072 |
| 1919..... | 123, 000 | 71, 734 | 19, 107 | 6, 532 | 7, 435 | 3, 114 | 3, 974 | 2, 243 | 1, 166 |
| 1920..... | 117, 000 | 61, 949 | 19, 857 | 6, 284 | 6, 250 | 5, 868 | 4, 639 | 2, 560 | 1, 446 |
| 1921..... | 127, 000 | 74, 240 | 17, 335 | 7, 931 | 5, 624 | 5, 806 | 4, 500 | 2, 681 | 1, 045 |
| 1922..... | 133, 000 | 75, 495 | 19, 067 | 7, 629 | 6, 864 | 5, 054 | 4, 717 | 2, 703 | 1, 150 |
| 1923..... | 118, 000 | 63, 164 | 17, 418 | 7, 206 | 6, 832 | 6, 034 | 4, 767 | 2, 566 | 937 |
| 1924..... | 127, 000 | 69, 601 | 17, 960 | 7, 801 | 7, 076 | 6, 779 | 4, 153 | 2, 818 | 903 |
| 1925..... | 127, 000 | 68, 851 | 18, 756 | 7, 951 | 6, 677 | 5, 752 | 4, 641 | 2, 949 | 925 |
| 1926..... | 126, 000 | 66, 463 | 17, 465 | 8, 255 | 7, 108 | 7, 169 | 4, 807 | 3, 083 | 1, 159 |
| 1927 ⁴ | 126, 000 | 63, 244 | 19, 510 | 8, 763 | 7, 331 | 6, 261 | 5, 435 | 3, 082 | 1, 244 |
| 1928 ⁴ | 130, 000 | 70, 972 | 18, 944 | | 7, 007 | | 4, 245 | | 1, 201 |
| 1929 ⁴ | | | 18, 338 | | 6, 569 | | 4, 334 | | 1, 117 |

Bureau of Agricultural Economics. The figures for each year include the crop harvested in the Northern Hemisphere within the calendar year and the following harvest in the Southern Hemisphere. Estimates of world rice production for the period 1900-1909 appear in *Agriculture Yearbook, 1924*, p. 653.

¹ China is an important producing country, but official statistics are not available.² Irrigated rice.³ Estimated figures obtained by multiplying acreage under rice as classified for revenue purposes up to 1912, and acreage as reported by the Department of Land and Agriculture from 1912 on by an average yield for the years 1920-1923, for which years official estimates have been published of acreage, yield, and total production.⁴ Preliminary.

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TABLE 109.—Rice, rough: Yield per acre and estimated price per bushel, December 1, by States, averages, and annual 1924-1929

| State | Yield per acre | | | | | | | Estimated price per bushel | | | | | | |
|---------------------|-------------------|-------|-------|-------|-------|-------|-------|----------------------------|-------|-------|-------|-------|-------|-------|
| | Average 1918-1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Average 1923-1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| Missouri..... | 49.1 | 50.0 | 75.0 | 61.0 | 25.0 | 40.0 | 35.0 | 120 | 140 | 140 | 110 | 90 | 90 | 95 |
| South Carolina..... | 21.7 | 14.0 | 10.0 | 17.0 | ----- | ----- | ----- | 126 | 140 | 125 | 120 | ----- | ----- | ----- |
| Georgia..... | 22.5 | 17.0 | 17.0 | 20.0 | ----- | ----- | ----- | 132 | 140 | 145 | 110 | ----- | ----- | ----- |
| Mississippi..... | 20.7 | 10.0 | 18.0 | 18.0 | ----- | ----- | ----- | 120 | 136 | 110 | 120 | ----- | ----- | ----- |
| Arkansas..... | 45.6 | 42.0 | 43.0 | ----- | 44.0 | 47.7 | 46.0 | 118 | 138 | 150 | 100 | 90 | 86 | 92 |
| Louisiana..... | 34.6 | 34.6 | 33.3 | 32.5 | 40.0 | 38.5 | 41.0 | 118 | 136 | 153 | 105 | 87 | 90 | 98 |
| Texas..... | 36.6 | 40.0 | 37.0 | ----- | 46.2 | 44.0 | 44.0 | 117 | 125 | 149 | 110 | 86 | 88 | 97 |
| California..... | 54.4 | 48.5 | 46.6 | 53.6 | 56.0 | 61.9 | 65.5 | 139 | 166 | 170 | 131 | 115 | 88 | 105 |
| United States..... | 39.1 | 38.2 | 37.5 | 40.4 | 44.2 | 44.3 | 45.0 | 121.0 | 138.5 | 153.8 | 109.6 | 92.9 | 88.5 | 97.8 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ 7-year average.

² 4-year average.

³ 9-year average.

TABLE 110.—Rice, rough: Receipts at New Orleans, 1909-1928

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Total |
|-----------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| 1909..... | 46,004 | 52,219 | 35,185 | 19,112 | 12,556 | 24,583 | 13,812 | 10,170 | 5,661 | 13,239 | 10,545 | 1,428 | 244,514 |
| 1910..... | 28,948 | 51,977 | 27,521 | 17,868 | 18,891 | 17,678 | 9,254 | 8,294 | 9,354 | 10,377 | 3,807 | 4,972 | 208,941 |
| 1911..... | 18,470 | 37,853 | 37,781 | 31,091 | 13,203 | 21,995 | 17,439 | 4,652 | 953 | 627 | 83 | 3,235 | 187,382 |
| 1912..... | 18,169 | 30,103 | 30,748 | 38,071 | 30,820 | 12,846 | 2,601 | 1,832 | 419 | 1,086 | 4,042 | 3,322 | 174,068 |
| 1913..... | 33,577 | 25,420 | 18,910 | 31,763 | 23,714 | 24,147 | 17,166 | 7,301 | 7,957 | 4,253 | 1,728 | 1,223 | 197,159 |
| 1914..... | 31,623 | 36,413 | 24,732 | 34,707 | 31,503 | 10,054 | 14,046 | 6,277 | 759 | 579 | 1,640 | 1,376 | 193,700 |
| 1915..... | 27,210 | 48,168 | 32,322 | 40,948 | 14,217 | 20,335 | 11,830 | 13,744 | 7,639 | 1,850 | 234 | 158 | 218,655 |
| 1916..... | 35,959 | 46,698 | 41,009 | 37,791 | 18,349 | 5,021 | 15,140 | 23,733 | 10,503 | 1,938 | 1,717 | 1,618 | 239,476 |
| 1917..... | 26,057 | 41,326 | 40,425 | 28,849 | 9,662 | 5,531 | 9,528 | 21,534 | 9,081 | 4,917 | 305 | 733 | 197,948 |
| 1918..... | 27,889 | 55,998 | 26,574 | 16,157 | 12,440 | 14,944 | 14,503 | 8,270 | 8,442 | 7,770 | 3,786 | 2,709 | 192,712 |
| 1919..... | 18,766 | 43,507 | 33,548 | 18,097 | 24,829 | 20,983 | 9,820 | 7,459 | 8,440 | 7,255 | 8,838 | 5,339 | 206,881 |
| 1920..... | 27,889 | 40,123 | 45,620 | 33,881 | 21,366 | 18,338 | 8,253 | 23,160 | 20,417 | 36,841 | 19,382 | 14,057 | 309,322 |
| 1921..... | 35,893 | 28,138 | 23,169 | 13,598 | 31,345 | 16,987 | 16,463 | 37,710 | 13,859 | 3,926 | 3,397 | 2,653 | 227,138 |
| 1922..... | 15,545 | 28,886 | 41,076 | 31,446 | 22,092 | 14,070 | 8,308 | 2,813 | 15,605 | 3,195 | 6,383 | 7,035 | 196,454 |
| 1923..... | 7,008 | 16,021 | 19,400 | 19,015 | 17,523 | 14,069 | 5,163 | 6,294 | 1,549 | 905 | 109 | 120 | 107,266 |
| 1924..... | 13,587 | 28,232 | 31,274 | 26,869 | 19,292 | 12,882 | 12,034 | 2,130 | 2,320 | 1,027 | 1,484 | 1,038 | 152,169 |
| 1925..... | 20,910 | 20,840 | 14,115 | 12,790 | 22,898 | 10,758 | 11,077 | 6,442 | 6,009 | 2,774 | 1,238 | 1,828 | 140,079 |
| 1926..... | 6,937 | 19,755 | 17,057 | 13,664 | 14,618 | 13,554 | 7,852 | 12,847 | 2,108 | 4,843 | 7,847 | 3,921 | 125,003 |
| 1927..... | 23,399 | 14,604 | 19,357 | 7,213 | 7,299 | 3,447 | 3,217 | 2,421 | 1,168 | 561 | 38 | ----- | 82,724 |
| 1928..... | 4,172 | 7,847 | 13,234 | 8,910 | 5,162 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Converted from figures on 162-pound sacks as published in annual report of New Orleans Board of Trade.

TABLE 111.—Rice, rough:¹ Wholesale price per 100 pounds, New Orleans, 1909-1929

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Average |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1909..... | 2.16 | 1.84 | 1.73 | 1.70 | 1.62 | 1.88 | 1.70 | 1.54 | 1.79 | 1.77 | 1.57 | 2.41 | 1.81 |
| 1910..... | 1.73 | 1.41 | 1.41 | 1.46 | 1.50 | 1.54 | 1.42 | 1.52 | 1.33 | 1.45 | 1.39 | 1.70 | 1.49 |
| 1911..... | 1.74 | 1.54 | 1.65 | 1.72 | 1.64 | 1.80 | 2.04 | 2.17 | 2.42 | 2.36 | 2.19 | 2.64 | 1.99 |
| 1912..... | 2.21 | 2.09 | 1.64 | 1.98 | 2.09 | 2.18 | 2.22 | 2.16 | 1.82 | 2.23 | 2.01 | 2.11 | 2.06 |
| 1913..... | 2.31 | 2.10 | 1.95 | 2.47 | 1.70 | 1.91 | 1.67 | 1.36 | 1.62 | 1.93 | 1.90 | 2.09 | 1.92 |
| 1914..... | 2.67 | 2.41 | 1.64 | 1.70 | 2.09 | 1.96 | 2.22 | 2.27 | 2.31 | 2.20 | 2.19 | 2.09 | 2.15 |
| 1915..... | 1.98 | 1.77 | 1.64 | 1.93 | 1.74 | 1.72 | 2.07 | 2.20 | 2.23 | 1.69 | ----- | 1.91 | ----- |
| 1916..... | 2.41 | 1.89 | 1.96 | 2.12 | 2.04 | 2.05 | 2.18 | 2.30 | 3.09 | 3.91 | 3.40 | 3.95 | 2.61 |
| 1917..... | 4.09 | 4.01 | 3.70 | 4.25 | 4.38 | 4.48 | 4.71 | 5.13 | 4.75 | 5.27 | 4.86 | 4.40 | 4.50 |
| 1918..... | 4.44 | 4.32 | 3.86 | 3.78 | 3.86 | 3.63 | ----- | ----- | ----- | 4.56 | ----- | 6.10 | ----- |
| 1919..... | 8.02 | 5.86 | 5.17 | 5.23 | 5.17 | 6.49 | ----- | ----- | 5.94 | 5.48 | 6.10 | ----- | ----- |
| 1920..... | 3.94 | 3.63 | 2.93 | 2.93 | ----- | ----- | 1.79 | 1.86 | ----- | 1.90 | 1.78 | 1.72 | ----- |
| 1921..... | 2.17 | 2.23 | 2.21 | 2.00 | ----- | 2.54 | 2.21 | 2.48 | 2.07 | 1.90 | 2.25 | 2.48 | ----- |
| 1922..... | 2.40 | 1.85 | 1.92 | 2.47 | 2.21 | 2.20 | 2.10 | 2.40 | ----- | 2.01 | 2.46 | ----- | ----- |
| 1923..... | 2.74 | 2.44 | 2.40 | 2.58 | 2.64 | 2.48 | 2.49 | 2.85 | 2.99 | 2.62 | ----- | ----- | ----- |
| 1924..... | 2.95 | 2.60 | 2.76 | 3.10 | 3.78 | 3.58 | ----- | ----- | 3.42 | 3.00 | 3.67 | 3.67 | ----- |
| 1925..... | 3.42 | 2.80 | 2.78 | 2.91 | 3.28 | 3.07 | 2.77 | 2.78 | 2.78 | 3.14 | 2.93 | ----- | ----- |
| 1926..... | ----- | 2.47 | 2.17 | 2.12 | ----- | 2.31 | 1.79 | ----- | ----- | 1.78 | 2.09 | ----- | ----- |
| 1927..... | 2.16 | 2.19 | 2.42 | ----- | 2.16 | ----- | 2.07 | ----- | ----- | ----- | ----- | ----- | ----- |
| 1928..... | 2.28 | ----- | 1.96 | 2.21 | ----- | ----- | ----- | ----- | 2.35 | ----- | ----- | ----- | ----- |
| 1929..... | ----- | ----- | 1.74 | 2.03 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Converted from price per 162 pounds, published in annual reports of the New Orleans Board of Trade.

¹ Price is average of range of all rough rice reported; includes Honduras, Japan, and Blue Rose, 1909-1927; 1928 and 1929 is Blue Rose only.

TABLE 112.—*Rice, including flour, meal, and broken rice: International trade, average 1909-1913, annual 1925-1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Average 1909-1913 | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | <i>Million pounds</i> | <i>Million pounds</i> | <i>Million pounds</i> | <i>Million pounds</i> | <i>Million pounds</i> | <i>Million pounds</i> | <i>Million pounds</i> | <i>Million pounds</i> | <i>Million pounds</i> | <i>Million pounds</i> |
| British India..... | 278 | 5,338 | 35 | 5,539 | 190 | 5,271 | 148 | 5,005 | 553 | 4,024 |
| Siam ¹ | 0 | 1,929 | 0 | 2,975 | 0 | 2,906 | 0 | 3,820 | 0 | ----- |
| Indo-China..... | 0 | 2,288 | 0 | 3,250 | 0 | 3,503 | 0 | 3,619 | 0 | 3,885 |
| Italy..... | 4 | 142 | 1 | 354 | 0 | 401 | 2 | 579 | 6 | 424 |
| United States..... | 210 | 16 | 68 | 67 | 117 | 117 | 48 | 310 | 37 | 379 |
| Madagascar ² | 0 | 14 | 0 | 92 | 0 | 48 | 0 | 23 | 0 | ----- |
| Spain..... | 5 | 18 | 1 | 100 | 0 | 142 | 117 | 117 | ----- | ----- |
| Brazil..... | 25 | 0 | 164 | 1 | 10 | 17 | 0 | 37 | 5 | 2 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| China..... | 705 | 0 | 1,685 | 5 | 2,493 | 4 | 2,812 | 12 | ----- | ----- |
| British Malaya..... | 2,000 | 1,299 | 1,461 | 554 | 1,696 | 629 | 1,887 | 660 | 1,805 | 620 |
| Japan..... | 656 | 62 | 1,714 | 29 | 768 | 14 | 1,300 | 12 | 618 | 9 |
| Dutch East Indies..... | 1,178 | 132 | 1,178 | 68 | 1,390 | 96 | 1,037 | 33 | 3,403 | 24 |
| Ceylon..... | 822 | 0 | 969 | 0 | 1,030 | 0 | 1,051 | 0 | 1,125 | 0 |
| Germany..... | 914 | 397 | 1,175 | 449 | 768 | 344 | 757 | 294 | 856 | 280 |
| France..... | 518 | 79 | 502 | 95 | 478 | 105 | 486 | 170 | 631 | 255 |
| Cuba..... | 262 | 0 | 424 | 0 | 477 | 0 | 436 | 0 | ----- | 0 |
| United Kingdom..... | 769 | 91 | 294 | 19 | 244 | 18 | 267 | 17 | 272 | 12 |
| Netherlands..... | 779 | 476 | 296 | 234 | 330 | 285 | 262 | 203 | 225 | 187 |
| Philippine Islands..... | 413 | 0 | 223 | 1 | 155 | 1 | 28 | 2 | 96 | 2 |
| Mauritius..... | 133 | 1 | 135 | 0 | 117 | 0 | 131 | 3 | ----- | ----- |
| Argentina..... | 93 | 6 | 149 | 1 | 127 | 0 | 154 | 0 | ----- | 0 |
| Russia..... | 250 | 6 | 195 | 10 | 183 | 10 | 149 | 10 | ----- | 0 |
| Czechoslovakia..... | 0 | 0 | 111 | 0 | 107 | 0 | 120 | 0 | 116 | 0 |
| Belgium..... | 181 | 100 | 85 | 3 | 83 | 4 | 100 | 4 | 102 | 2 |
| Egypt..... | 99 | 54 | 98 | 62 | 97 | 40 | 32 | 83 | 31 | 168 |
| Austria..... | 183 | 10 | 58 | 0 | 54 | 0 | 59 | 0 | 62 | 0 |
| Canada..... | 32 | 2 | 45 | 2 | 39 | 2 | 43 | 1 | 47 | 0 |
| Hungary..... | 0 | 0 | 32 | 1 | 12 | 4 | 7 | 5 | 5 | 3 |
| Total, 28 countries..... | 10,509 | 12,450 | 11,098 | 13,901 | 10,863 | 13,051 | 11,316 | 15,009 | 6,995 | 10,277 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. Mostly cleaned rice. Under rice is included paddy, unhulled, rough, cleaned, polished, broken, and cargo rice, in addition to rice flour and meal. Rice bran is not included. Rough rice, or paddy, where specifically reported, has been reduced to terms of cleaned rice at the ratio of 162 pounds of rough or unhulled to 100 pounds of cleaned. "Rice, other than whole or cleaned rice," in the returns of the United Kingdom is not considered paddy, since the chief sources of supply indicate that it is practically all hulled rice. Cargo rice, a mixture of hulled and unhulled, is included without being reduced to terms of cleaned. Broken rice and rice flour and meal, are taken without being reduced to terms of whole cleaned rice.

¹ Fiscal year Apr. 1-Mar. 31.

² International Yearbook of Agricultural Statistics.

³ Java and Madura only.

⁴ 2-year average.

⁵ Average for Austria-Hungary.

STATISTICS OF GRAINS

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TABLE 113.—*Rice, Blue Rose, clean: Average wholesale price per 100 pounds, New Orleans, 1914-1929*

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Average |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1914..... | 3.88 | 3.38 | 3.06 | 2.87 | 2.97 | 2.75 | 3.06 | 3.38 | 3.56 | 3.68 | 3.81 | 3.40 | 3.32 |
| 1915..... | 3.40 | 3.31 | 3.00 | 3.31 | 3.10 | 3.18 | 3.31 | 3.87 | 4.94 | 6.18 | 6.13 | 6.25 | 4.17 |
| 1916..... | 4.75 | 6.81 | 6.32 | 6.56 | 5.94 | 6.41 | 6.64 | 7.56 | 8.19 | 8.94 | 8.90 | 8.94 | 7.15 |
| 1917..... | 7.88 | 6.75 | 6.56 | 6.44 | 6.06 | 5.94 | 5.94 | 5.83 | 5.63 | 5.25 | 8.00 | 10.82 | 6.76 |
| 1918..... | 9.00 | 8.44 | 8.44 | 9.25 | 9.81 | 10.19 | 10.38 | 10.12 | 9.50 | 9.19 | 8.00 | 8.00 | 3.76 |
| 1919..... | 7.25 | 6.25 | 5.38 | 4.62 | 3.44 | 3.00 | 2.50 | 2.38 | 2.25 | 2.40 | 2.56 | 3.06 | 3.57 |
| 1920..... | 3.19 | 3.50 | 3.78 | 3.69 | 3.12 | 3.10 | 3.18 | 3.44 | 3.56 | 3.60 | 4.31 | 4.38 | 3.91 |
| 1921..... | 4.10 | 4.25 | 3.62 | 3.82 | 4.00 | 4.06 | 3.94 | 3.91 | 4.00 | 3.50 | 3.75 | 3.94 | 4.94 |
| 1922..... | 3.78 | 4.00 | 1.88 | 4.66 | 4.38 | 4.62 | 4.60 | 5.06 | 5.06 | 5.88 | 6.12 | 6.19 | 6.17 |
| 1923..... | 5.88 | 5.69 | 5.12 | 5.50 | 6.10 | 6.30 | 6.50 | 6.38 | 6.34 | 6.50 | 6.81 | 6.88 | 6.18 |
| 1924..... | 6.62 | 6.31 | 5.69 | 6.34 | 6.41 | 6.31 | 6.59 | 6.25 | 6.19 | 5.60 | 5.94 | 5.94 | 4.51 |
| 1925..... | 4.94 | 5.62 | 4.81 | 4.44 | 4.38 | 4.50 | 4.19 | 4.34 | 4.06 | 4.12 | 4.52 | 4.22 | 3.87 |
| 1926..... | 4.12 | 4.12 | 3.84 | 3.62 | 3.69 | 3.75 | 3.66 | 3.62 | 3.50 | 4.12 | 4.28 | 4.12 | 3.94 |
| 1927..... | 4.12 | 3.91 | 3.81 | 3.94 | 4.12 | 3.88 | 3.88 | 3.88 | 3.75 | 3.81 | 3.94 | 3.94 | 3.94 |
| 1928..... | 4.25 | 3.72 | 3.78 | 3.88 | 3.84 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 1929..... | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from annual reports of the New Orleans Board of Trade.

TABLE 114.—*Buckwheat: Acreage, production, value, exports, etc., United States, 1909-1929*

| Year | Acreage | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Foreign trade, including flour, year beginning July 1 ¹ | | |
|-------------------------|-------------|------------------------|---------------|---|-------------------|--|---------------|--------------------------|
| | | | | | | Domestic exports | Imports | Net balance ² |
| | 1,000 acres | Bushels of 48 lbs. | 1,000 bushels | Cents | 1,000 dollars | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1909..... | 878 | 16.9 | 14,849 | 70.2 | 12,628 | 158 | 11 | +147 |
| 1909..... | 878 | 20.5 | 17,983 | 66.1 | 11,636 | ----- | 92 | -92 |
| 1910..... | 860 | 20.5 | 17,598 | 72.6 | 12,735 | ----- | 21 | -21 |
| 1911..... | 833 | 21.1 | 17,549 | 66.1 | 12,720 | 1 | 64 | -63 |
| 1912..... | 841 | 22.9 | 19,249 | 75.5 | 10,445 | 1 | 206 | -205 |
| 1913..... | 865 | 17.2 | 13,833 | 76.4 | 12,892 | 414 | 259 | +155 |
| 1914..... | 792 | 21.3 | 16,881 | 78.7 | 11,843 | 515 | 402 | +113 |
| 1915..... | 769 | 14.1 | 11,662 | 112.7 | 13,147 | 260 | 266 | -6 |
| 1916..... | 828 | 17.3 | 16,022 | 160.0 | 25,631 | 6 | 510 | -504 |
| 1917..... | 924 | 16.5 | 16,905 | 166.5 | 28,142 | 119 | 413 | -294 |
| 1918..... | 1,027 | 17.1 | 12,690 | 146.1 | 21,032 | 245 | 160 | +85 |
| 1919..... | 743 | 20.6 | 14,399 | 128.3 | 16,863 | 399 | 336 | +63 |
| 1920..... | 701 | 18.7 | 13,142 | 81.2 | 11,540 | 485 | 113 | +372 |
| 1921..... | 680 | 20.9 | 14,207 | 88.5 | 12,889 | 172 | 286 | -114 |
| 1922..... | 764 | 18.9 | 13,965 | 93.3 | 13,029 | 92 | 322 | -230 |
| 1923..... | 739 | 16.8 | 12,004 | 102.6 | 13,708 | 191 | 546 | -355 |
| 1924..... | 717 | 17.9 | 13,357 | 88.8 | 12,423 | 79 | 88 | -9 |
| 1925..... | 745 | 18.7 | 13,994 | 88.2 | 11,183 | 66 | 86 | -20 |
| 1926..... | 747 | 18.3 | 12,676 | 83.5 | 13,155 | 554 | 74 | +480 |
| 1927..... | 694 | 19.5 | 15,755 | 87.5 | 11,511 | 229 | 79 | +150 |
| 1928..... | 810 | 17.6 | 13,148 | 97.7 | 11,241 | ----- | ----- | ----- |
| 1929 ³ | 719 | 15.8 | 11,505 | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns. See 1927 Yearbook, page 825, for data for earlier years.

¹ Compiled from Commerce and Navigation of the United States, 1909-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1926; January and June issues, 1927-1929 and official records of the Bureau of Foreign and Domestic Commerce. Buck wheat and buck wheat flour—Imports for consumption, 1909-1929. Buck wheat flour converted to terms of grain on the basis that 1 barrel of flour is the product of 7 bushels of grain.

² The difference between total exports (domestic exports plus reexports) and total imports. Net exports indicated by +; net imports indicated by -.

³ Preliminary.

TABLE 115.—*Buckwheat: Acreage harvested and production, by States, average 1923-1927, annual 1926-1929*

| State and division | Acreage harvested | | | | | Production | | | | |
|---------------------|--------------------------|----------------|----------------|----------------|-------------------|--------------------------|------------------|------------------|------------------|-------------------|
| | Average 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ | Average 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Maine..... | 13 | 15 | 14 | 13 | 13 | 315 | 345 | 322 | 290 | 364 |
| Vermont..... | 3 | 3 | 2 | 2 | 2 | 61 | 69 | 52 | 48 | 50 |
| New York..... | 213 | 190 | 201 | 192 | 198 | 4,216 | 3,591 | 4,221 | 3,475 | 3,168 |
| New Jersey..... | 4 | 2 | 1 | 1 | 2 | 77 | 36 | 21 | 20 | 36 |
| Pennsylvania..... | 207 | 190 | 210 | 195 | 199 | 4,394 | 3,610 | 4,935 | 3,802 | 3,383 |
| North Atlantic..... | 441 | 400 | 428 | 403 | 414 | 9,078 | 7,651 | 9,551 | 7,644 | 7,001 |
| Ohio..... | 26 | 22 | 28 | 35 | 38 | 490 | 385 | 588 | 700 | 673 |
| Indiana..... | 15 | 20 | 15 | 15 | 15 | 233 | 320 | 255 | 225 | 218 |
| Illinois..... | 6 | 5 | 6 | 5 | 5 | 81 | 65 | 97 | 70 | 75 |
| Michigan..... | 52 | 50 | 53 | 48 | 45 | 724 | 765 | 689 | 720 | 405 |
| Wisconsin..... | 25 | 23 | 23 | 25 | 21 | 376 | 345 | 382 | 412 | 304 |
| Minnesota..... | 72 | 66 | 126 | 88 | 70 | 1,012 | 1,122 | 1,764 | 1,074 | 812 |
| Iowa..... | 7 | 5 | 15 | 6 | 6 | 108 | 90 | 195 | 87 | 81 |
| Missouri..... | 1 | 1 | 1 | 1 | 1 | 15 | 15 | 20 | 13 | 15 |
| North Dakota..... | ² 8 | 9 | 11 | 10 | 5 | ² 108 | 135 | 160 | 145 | 30 |
| South Dakota..... | 11 | 9 | 18 | 19 | 16 | 162 | 126 | 279 | 276 | 152 |
| Nebraska..... | 1 | 1 | 1 | 1 | 1 | 15 | 11 | 15 | 10 | 11 |
| North Central..... | 223 | 211 | 297 | 253 | 223 | 3,302 | 3,379 | 4,444 | 3,732 | 2,776 |
| Delaware..... | 4 | 2 | 2 | 2 | 2 | 62 | 32 | 37 | 34 | 36 |
| Maryland..... | 8 | 8 | 8 | 7 | 7 | 166 | 162 | 176 | 133 | 126 |
| Virginia..... | 16 | 16 | 14 | 17 | 15 | 305 | 352 | 294 | 326 | 292 |
| West Virginia..... | 35 | 36 | 39 | 40 | 40 | 668 | 684 | 858 | 800 | 760 |
| North Carolina..... | 10 | 10 | 10 | 10 | 11 | 188 | 220 | 200 | 190 | 220 |
| South Atlantic..... | 72 | 72 | 73 | 76 | 75 | 1,390 | 1,450 | 1,565 | 1,483 | 1,434 |
| Kentucky..... | 8 | 8 | 9 | 14 | 14 | 126 | 136 | 144 | 238 | 252 |
| Tennessee..... | 3 | 3 | 3 | 3 | 3 | 54 | 60 | 51 | 51 | 42 |
| South Central..... | 11 | 11 | 12 | 17 | 17 | 180 | 196 | 195 | 289 | 294 |
| United States..... | 747 | 694 | 810 | 749 | 729 | 13,949 | 12,676 | 15,755 | 13,148 | 11,505 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.² 4-year average.

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TABLE 116.—*Buckwheat: Yield per acre and estimated price per bushel, December 1, by States, averages, and annual 1924-1929*

| State and division | Yield per acre | | | | | | | Estimated price per bushel | | | | | | |
|---------------------|-----------------------|-------|-------|-------|-------|-------|-------|----------------------------|-------|-------|------|------|------|-------|
| | Av., 1918- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Av., 1924- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| Maine..... | 24.4 | 24.0 | 26.0 | 23.0 | 23.0 | 23.0 | 28.0 | 93 | 95 | 100 | 83 | 90 | 90 | 90 |
| Vermont..... | 22.1 | 22.0 | 22.0 | 23.0 | 26.0 | 24.0 | 25.0 | 95 | 105 | 90 | 85 | 96 | 105 | 110 |
| New York..... | 19.8 | 21.0 | 19.0 | 18.9 | 21.0 | 18.1 | 16.0 | 91 | 101 | 86 | 89 | 84 | 90 | 100 |
| New Jersey..... | 19.7 | 19.0 | 21.0 | 18.0 | 21.0 | 20.0 | 18.0 | 99 | 117 | 100 | 100 | 84 | 92 | 105 |
| Pennsylvania..... | 20.8 | 19.0 | 23.0 | 19.0 | 23.5 | 19.5 | 17.0 | 92 | 103 | 91 | 89 | 85 | 80 | 100 |
| North Atlantic..... | 20.4 | 20.1 | 21.0 | 19.1 | 22.3 | 19.0 | 16.9 | 91.6 | 101.8 | 89.0 | 88.7 | 84.8 | 89.6 | 99.6 |
| Ohio..... | 19.9 | 16.0 | 19.7 | 17.5 | 21.0 | 20.0 | 17.7 | 93 | 103 | 86 | 95 | 86 | 87 | 92 |
| Indiana..... | 16.3 | 14.0 | 13.2 | 16.0 | 17.0 | 15.0 | 14.5 | 93 | 103 | 85 | 95 | 85 | 85 | 95 |
| Illinois..... | 15.7 | 14.0 | 14.0 | 13.0 | 16.2 | 14.0 | 15.0 | 100 | 120 | 100 | 92 | 85 | 90 | 98 |
| Michigan..... | 13.8 | 14.0 | 13.7 | 15.3 | 13.0 | 15.0 | 9.0 | 86 | 96 | 90 | 10 | 80 | 79 | 85 |
| Wisconsin..... | 15.2 | 13.0 | 16.0 | 15.0 | 16.6 | 16.5 | 14.5 | 88 | 103 | 79 | 87 | 82 | 83 | 93 |
| Minnesota..... | 15.2 | 12.0 | 14.0 | 17.0 | 14.0 | 12.2 | 11.6 | 82 | 102 | 75 | 75 | 70 | 76 | 84 |
| Iowa..... | 15.4 | 15.0 | 17.5 | 18.0 | 13.0 | 14.5 | 13.5 | 91 | 103 | 90 | 82 | 85 | 90 | 95 |
| Missouri..... | 14.6 | 13.0 | 14.0 | 15.0 | 20.0 | 13.0 | 15.0 | 98 | 105 | 90 | 85 | 90 | 95 | 100 |
| North Dakota..... | 12.4 | 8.0 | 12.0 | 15.0 | 14.5 | 14.5 | 6.0 | 66 | 60 | 60 | 80 | 64 | 68 | 73 |
| South Dakota..... | 14.4 | 14.8 | 12.0 | 14.0 | 15.5 | 14.5 | 9.5 | 81 | 107 | 70 | 80 | 64 | 67 | 74 |
| Nebraska..... | 15.1 | 15.0 | 14.0 | 11.0 | 15.3 | 9.6 | 11.2 | 92 | 100 | 100 | 90 | 85 | 85 | 85 |
| North Central..... | 15.3 | 13.5 | 14.7 | 16.0 | 15.0 | 14.8 | 12.4 | 86.2 | 100.8 | 82.0 | 82.6 | 76.1 | 79.6 | 88.0 |
| Delaware..... | 17.5 | 16.8 | 16.0 | 16.0 | 18.5 | 17.0 | 18.0 | 94 | 102 | 92 | 90 | 95 | 95 | 100 |
| Maryland..... | 20.9 | 18.0 | 24.0 | 20.2 | 22.0 | 19.0 | 18.0 | 101 | 110 | 100 | 100 | 93 | 95 | 100 |
| Virginia..... | 19.8 | 17.3 | 16.0 | 22.0 | 21.0 | 19.2 | 19.5 | 100 | 106 | 110 | 95 | 93 | 95 | 99 |
| West Virginia..... | 19.9 | 17.0 | 18.0 | 19.0 | 22.0 | 20.0 | 19.0 | 101 | 112 | 100 | 100 | 97 | 97 | 110 |
| North Carolina..... | 19.0 | 18.0 | 14.0 | 22.0 | 20.0 | 19.0 | 20.0 | 107 | 119 | 110 | 100 | 100 | 100 | 107 |
| South Atlantic..... | 19.7 | 17.3 | 17.5 | 20.1 | 21.4 | 19.5 | 19.1 | 101.2 | 111.0 | 102.8 | 98.6 | 96.1 | 96.7 | 106.1 |
| Kentucky..... | 15.6 | 14.0 | 12.5 | 17.0 | 16.0 | 17.0 | 18.0 | 98 | 119 | 100 | 81 | 86 | 86 | 102 |
| Tennessee..... | 17.2 | 19.0 | 15.0 | 20.0 | 17.0 | 17.0 | 14.0 | 108 | 125 | 115 | 100 | 90 | 100 | 110 |
| South Central..... | 16.4 | 15.5 | 13.3 | 17.8 | 16.2 | 17.0 | 17.3 | 101.0 | 121.3 | 105.3 | 88.8 | 87.2 | 88.6 | 103.1 |
| United States..... | 18.9 | 17.9 | 18.7 | 18.3 | 19.5 | 17.6 | 15.8 | 91.3 | 102.6 | 88.8 | 88.2 | 83.5 | 87.5 | 97.7 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ 4-year average.

TABLE 117.—*Buckwheat: Estimated average price per bushel, received by producers, United States, 1909-1929*

| Year beginning September | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Weighted average |
|-----------------------------|-------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|------------|------------|---------------------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1909..... | 76.0 | 73.3 | 70.8 | 70.0 | 71.0 | 71.3 | 72.0 | 72.2 | 72.4 | 75.8 | 76.4 | 73.7 | 72.1 |
| 1910..... | 72.0 | 68.6 | 66.0 | 66.0 | 65.1 | 64.2 | 64.7 | 65.6 | 68.0 | 71.2 | 74.2 | 75.0 | 67.5 |
| 1911..... | 71.8 | 71.3 | 72.8 | 73.2 | 73.6 | 75.2 | 76.9 | 78.4 | 82.4 | 85.5 | 84.9 | 80.1 | 75.4 |
| 1912..... | 73.2 | 67.6 | 65.8 | 66.4 | 68.1 | 68.2 | 67.6 | 69.8 | 71.1 | 71.8 | 72.6 | 71.2 | 68.3 |
| 1913..... | 72.0 | 74.8 | 75.5 | 76.0 | 76.1 | 75.4 | 76.0 | 77.1 | 78.2 | 82.5 | 83.4 | 80.5 | 76.6 |
| 1914..... | 79.2 | 78.4 | 77.2 | 77.2 | 80.8 | 84.6 | 85.4 | 85.0 | 85.8 | 82.5 | 90.6 | 85.3 | 81.1 |
| 1915..... | 77.6 | 76.1 | 78.0 | 80.1 | 81.1 | 82.0 | 83.2 | 84.0 | 86.0 | 90.0 | 91.0 | 87.7 | 81.5 |
| 1916..... | 88.4 | 96.6 | 107.8 | 115.0 | 115.9 | 119.7 | 126.6 | 139.4 | 167.2 | 196.4 | 199.2 | 176.8 | 126.5 |
| 1917..... | 159.4 | 154.3 | 157.1 | 161.4 | 162.3 | 165.0 | 169.2 | 173.0 | 183.5 | 195.9 | 196.8 | 191.5 | 167.1 |
| 1918..... | 185.2 | 176.5 | 169.8 | 164.7 | 160.5 | 153.2 | 149.0 | 148.4 | 156.4 | 163.2 | 163.4 | 162.8 | 164.7 |
| 1919..... | 100.9 | 156.5 | 148.6 | 148.4 | 152.8 | 155.3 | 159.4 | 166.0 | 174.5 | 191.4 | 192.0 | 178.8 | 159.2 |
| 1920..... | 167.8 | 145.2 | 129.6 | 126.8 | 122.0 | 117.5 | 112.8 | 112.6 | 116.0 | 115.7 | 117.5 | 117.0 | 126.8 |
| 1921..... | 110.2 | 95.0 | 82.6 | 82.4 | 84.4 | 85.6 | 89.2 | 93.0 | 95.4 | 100.0 | 99.2 | 91.0 | 89.1 |
| 1922..... | 85.2 | 82.2 | 84.4 | 89.0 | 88.5 | 88.6 | 92.6 | 95.0 | 98.4 | 102.3 | 101.4 | 99.4 | 89.9 |
| 1923..... | 96.6 | 94.2 | 93.4 | 94.7 | 92.7 | 92.5 | 94.7 | 93.6 | 97.0 | 96.5 | 104.5 | 123.9 | 96.3 |
| 1924..... | 118.8 | 107.1 | 106.8 | 104.6 | 107.0 | 112.2 | 112.4 | 104.1 | 113.3 | 112.3 | 115.7 | 110.0 | 108.6 |
| 1925..... | 101.2 | 87.6 | 86.7 | 87.9 | 85.7 | 80.9 | 81.7 | 82.5 | 85.0 | 90.1 | 89.9 | 93.7 | 87.5 |
| 1926..... | 90.4 | 80.5 | 83.6 | 83.5 | 83.6 | 84.6 | 86.0 | 85.1 | 88.1 | 98.8 | 101.0 | 98.1 | 87.0 |
| 1927..... | 92.3 | 82.9 | 79.4 | 81.0 | 82.0 | 85.2 | 90.2 | 94.8 | 102.3 | 109.0 | 108.0 | 98.1 | 87.6 |
| 1928..... | 92.0 | 84.5 | 84.8 | 88.7 | 91.2 | 94.3 | 94.1 | 96.4 | 96.5 | 94.7 | 100.4 | 99.6 | 90.7 |
| 1929..... | 96.6 | 95.8 | 95.6 | 95.9 | 95.9 | 95.9 | 95.9 | 95.9 | 95.9 | 95.9 | 95.9 | 95.9 | 95.9 |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of buckwheat for each State; yearly price obtained by weighting monthly prices by average monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, September, 1909-December, 1923.

TABLE 118.—*Sorghums for grain, forage, and all purposes:*¹ *Acreage, production, value, United States, 1919-1929*

| Year | For grain | | | For forage | | | For all purposes | | | Price per bushel received by producers Dec. 1 ² | Farm value Dec. 1 |
|-------------------------|-------------|----------------|---------------|-------------|----------------|------------|------------------|---------------------------|--|--|-------------------|
| | Acreage | Yield per acre | Production | Acreage | Yield per acre | Production | Acreage | Equivalent yield per acre | Equivalent production on total acreage | | |
| | 1,000 acres | Bushels | 1,000 bushels | 1,000 acres | Tons | 1,000 tons | 1,000 acres | Bushels | 1,000 bushels | Cents | 1,000 dollars |
| 1919..... | 3,775 | 28.0 | 105,858 | 2,666 | 2.10 | 5,603 | 6,441 | 24.5 | 157,805 | 128.1 | 202,094 |
| 1920..... | 4,232 | 28.6 | 120,848 | 2,562 | 2.16 | 5,539 | 6,704 | 25.7 | 174,790 | 93.7 | 163,860 |
| 1921..... | 3,920 | 25.9 | 101,506 | 2,465 | 1.99 | 4,900 | 6,385 | 23.1 | 147,609 | 39.0 | 57,576 |
| 1922..... | 3,566 | 19.1 | 68,154 | 2,212 | 1.63 | 3,601 | 5,778 | 17.0 | 98,158 | 88.1 | 86,517 |
| 1923..... | 4,403 | 19.2 | 81,505 | 2,258 | 1.72 | 3,895 | 6,661 | 17.4 | 116,109 | 95.0 | 110,258 |
| 1924..... | 3,778 | 21.1 | 79,890 | 2,311 | 1.80 | 4,157 | 6,089 | 19.2 | 117,057 | 85.2 | 90,785 |
| 1925..... | 4,076 | 18.3 | 74,467 | 2,564 | 1.61 | 4,118 | 6,640 | 16.0 | 100,434 | 75.4 | 80,251 |
| 1926..... | 4,367 | 22.9 | 100,044 | 2,323 | 1.75 | 4,061 | 6,690 | 20.6 | 137,515 | 53.9 | 74,065 |
| 1927..... | 4,394 | 22.8 | 100,364 | 2,329 | 2.06 | 4,800 | 6,723 | 20.4 | 137,358 | 61.6 | 84,614 |
| 1928..... | 4,311 | 23.0 | 99,282 | 2,196 | 2.16 | 4,718 | 6,497 | 21.9 | 142,513 | 62.0 | 88,429 |
| 1929 ³ | 3,403 | 18.7 | 63,484 | 2,518 | 1.81 | 4,500 | 5,921 | 17.0 | 100,845 | 71.0 | 71,617 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Kafir, milo, feterita, durra, etc.² From 1919 to 1924, Nov. 15 price.³ Preliminary.TABLE 119.—*Sorghums:*¹ *Acreage and production, by States, average 1923-1927 annual 1926-1929*

| State | Acreage for all purposes | | | | | Production for all purposes | | | | |
|--------------------|--------------------------|-------------|-------------|-------------|-------------------|-----------------------------|---------------|---------------|---------------|-------------------|
| | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ² | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ² |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Missouri..... | 88 | 94 | 113 | 90 | 89 | 1,649 | 1,692 | 2,712 | 2,178 | 1,513 |
| Nebraska..... | 25 | 22 | 30 | 24 | 22 | 471 | 233 | 705 | 485 | 376 |
| Kansas..... | 1,474 | 1,345 | 1,547 | 1,284 | 1,091 | 25,943 | 20,175 | 32,487 | 28,633 | 19,638 |
| Oklahoma..... | 1,723 | 1,817 | 1,744 | 1,709 | 1,384 | 27,754 | 34,523 | 34,880 | 30,762 | 20,483 |
| Texas..... | 2,633 | 2,854 | 2,654 | 2,760 | 2,780 | 55,897 | 71,350 | 55,734 | 69,000 | 46,920 |
| Colorado..... | 262 | 227 | 284 | 256 | 205 | 2,861 | 1,135 | 2,840 | 2,688 | 2,265 |
| New Mexico..... | 204 | 195 | 171 | 188 | 203 | 3,645 | 4,095 | 2,394 | 3,384 | 4,466 |
| Arizona..... | 46 | 40 | 50 | 52 | 52 | 1,246 | 1,240 | 1,550 | 1,508 | 1,560 |
| California..... | 107 | 96 | 130 | 125 | 115 | 3,427 | 3,072 | 4,056 | 3,875 | 3,634 |
| United States..... | 6,561 | 6,690 | 6,723 | 6,497 | 5,921 | 122,895 | 137,515 | 137,358 | 142,513 | 100,845 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Kafir, milo, feterita, durra, etc.² Preliminary.

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TABLE 120.—*Sorghums:*¹ *Yield per acre and estimated price per bushel, December 1, by States, averages, and annual 1924-1929*

| State | Yield per acre | | | | | | | Estimated price per bushel | | | | | | |
|-----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------|-------------------|-------------|-------------|-------------|-------------|-------------|
| | Average, 1919-1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Average, 1923-1927 | 1924 ² | 1925 | 1926 | 1927 | 1928 | 1929 |
| | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Bush.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| Missouri..... | 21.0 | 15.0 | 15.0 | 18.0 | 24.0 | 22.0 | 17.0 | 94 | 115 | 100 | 80 | 75 | 80 | 100 |
| Nebraska..... | 19.2 | 18.0 | 15.0 | 10.6 | 23.5 | 20.2 | 17.1 | 83 | 91 | 75 | 80 | 80 | 85 | 100 |
| Kansas..... | 18.7 | 18.8 | 16.0 | 15.0 | 21.0 | 22.3 | 18.0 | 71 | 80 | 71 | 60 | 60 | 61 | 70 |
| Oklahoma..... | 17.4 | 18.0 | 12.5 | 19.0 | 20.0 | 18.0 | 14.8 | 68 | 77 | 75 | 45 | 50 | 62 | 65 |
| Texas..... | 23.7 | 21.0 | 18.0 | 25.0 | 21.0 | 25.0 | 17.0 | 78 | 87 | 76 | 55 | 65 | 69 | 70 |
| Colorado..... | 12.2 | 8.0 | 11.0 | 5.0 | 10.0 | 10.5 | 11.0 | 73 | 90 | 71 | 60 | 65 | 60 | 80 |
| New Mexico..... | 18.7 | 20.0 | 18.0 | 21.0 | 14.0 | 18.0 | 22.0 | 75 | 100 | 65 | 40 | 80 | 60 | 65 |
| Arizona..... | 26.7 | 18.0 | 20.0 | 31.0 | 31.0 | 29.0 | 30.0 | 86 | 130 | 66 | 60 | 75 | 80 | 95 |
| California..... | 30.7 | 30.5 | 34.0 | 32.0 | 31.2 | 31.0 | 31.6 | 105 | 135 | 107 | 84 | 97 | 90 | 100 |
| United States.. | 20.4 | 19.2 | 16.0 | 20.6 | 20.4 | 21.9 | 17.0 | 76.5 | 85.2 | 75.4 | 53.9 | 61.6 | 62.0 | 71.0 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ *Kafirs, milo, feterita, durra, etc.*

² Nov. 15 price.

TABLE 121.—*Grain sorghums:*¹ *Receipts at Kansas City, by months, 1909-1928*

| Year beginning November | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Total |
|-------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> |
| 1909..... | 106 | 50 | 125 | 150 | 161 | 45 | 32 | 20 | 12 | 8 | 5 | 4 | 718 |
| 1910..... | 107 | 287 | 224 | 179 | 86 | 52 | 71 | 56 | 30 | 42 | 19 | 62 | 1,215 |
| 1911..... | 202 | 323 | 255 | 410 | 191 | 198 | 186 | 121 | 75 | 46 | 62 | 103 | 2,172 |
| 1912..... | 446 | 645 | 610 | 333 | 111 | 151 | 129 | 223 | 90 | 11 | 33 | 26 | 2,808 |
| 1913..... | 22 | 53 | 133 | 72 | 25 | 15 | 16 | 15 | 3 | 1 | 9 | 42 | 406 |
| 1914..... | 311 | 719 | 661 | 618 | 189 | 486 | 252 | 186 | 206 | 204 | 112 | 130 | 4,074 |
| 1915..... | 367 | 1,116 | 1,200 | 936 | 866 | 682 | 625 | 256 | 202 | 104 | 85 | 24 | 6,463 |
| 1916..... | 79 | 199 | 192 | 274 | 72 | 45 | 38 | 9 | 8 | 8 | 6 | 6 | 936 |
| 1917..... | 88 | 278 | 464 | 385 | 506 | 322 | 98 | 107 | 40 | 29 | 9 | 7 | 2,333 |
| 1918..... | 51 | 163 | 153 | 168 | 384 | 329 | 375 | 95 | 160 | 65 | 87 | 80 | 2,110 |
| 1919..... | 22 | 233 | 745 | 721 | 741 | 449 | 540 | 817 | 768 | 235 | 160 | 123 | 5,554 |
| 1920..... | 112 | 654 | 980 | 463 | 569 | 287 | 301 | 644 | 234 | 293 | 120 | 209 | 4,866 |
| 1921..... | 263 | 350 | 471 | 537 | 392 | 312 | 199 | 212 | 150 | 84 | 35 | 120 | 3,125 |
| 1922..... | 168 | 444 | 420 | 233 | 169 | 139 | 76 | 50 | 69 | 35 | 19 | 18 | 1,840 |
| 1923..... | 195 | 350 | 465 | 579 | 398 | 340 | 274 | 262 | 250 | 106 | 63 | 103 | 3,385 |
| 1924..... | 647 | 1,152 | 683 | 636 | 497 | 320 | 301 | 440 | 221 | 183 | 68 | 24 | 5,172 |
| 1925..... | 279 | 629 | 416 | 290 | 261 | 211 | 290 | 469 | 162 | 94 | 136 | 97 | 3,334 |
| 1926..... | 397 | 493 | 626 | 442 | 293 | 216 | 192 | 241 | 249 | 285 | 79 | 112 | 3,625 |
| 1927..... | 410 | 905 | 696 | 519 | 692 | 392 | 323 | 343 | 224 | 87 | 51 | 236 | 4,778 |
| 1928..... | 449 | 675 | | | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from annual statistical reports of Kansas City Board of Trade.

¹ Includes kafir corn, milo maize, and feterita. Quoted as kafir in Table 117, 1927 Yearbook.

TABLE 122.—*Grain sorghums: Classification of receipts graded by licensed inspectors, all inspection points*

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE, 1925-1928; BY GRADE AND CLASS, 1928-29

| Year and class | Receipts of— | | | | | |
|-----------------|--------------|-------------|-------------|-------------|--------------|-------------|
| | No. 1 | No. 2 | No. 3 | No. 4 | Sample grade | Total |
| Beginning July— | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| 1925 | 312 | 4, 158 | 5, 796 | 1, 639 | 495 | 12, 400 |
| 1926 | 878 | 7, 180 | 6, 674 | 1, 792 | 601 | 17, 215 |
| 1927 | 1, 175 | 9, 885 | 8, 125 | 3, 143 | 965 | 23, 283 |
| 1928 | 866 | 7, 247 | 5, 400 | 6, 794 | 3, 969 | 24, 276 |

TOTAL INSPECTIONS, BY GRADE AND CLASS, JULY 1, 1928, TO JUNE 30, 1929

| | | | | | | |
|---------------------|-----|--------|--------|--------|--------|---------|
| Kafir..... | 466 | 4, 138 | 2, 138 | 2, 607 | 1, 604 | 10, 953 |
| Milo..... | 357 | 2, 461 | 2, 450 | 2, 715 | 1, 597 | 9, 580 |
| Durra..... | 5 | 1 | 2 | 0 | 0 | 8 |
| Feterita..... | 5 | 8 | 4 | 7 | 4 | 28 |
| Durso..... | 3 | 5 | 10 | 9 | 16 | 43 |
| Freed sorgo..... | 0 | 2 | 9 | 9 | 1 | 21 |
| Brown kaoliang..... | 0 | 0 | 0 | 0 | 0 | 0 |
| White hegari..... | 0 | 0 | 0 | 0 | 0 | 0 |
| Schrock kafir..... | 0 | 1 | 0 | 5 | 0 | 6 |
| Shallu..... | 1 | 0 | 0 | 0 | 0 | 1 |
| Mixed..... | 20 | 631 | 787 | 1, 442 | 747 | 3, 636 |

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TABLE 123.—*Kafir, No. 2 White: Weighted average price¹ per bushel of reported cash sales, Kansas City, 1909-1929*

| Year beginning November | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Average |
|-------------------------|------------------|--------------|------------------|------------------|--------------|------------------|--------------|------------------|------------------|------------------|------------------|------------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909 | 67 | 73 | 86 | 80 | 77 | 74 | 82 | 84 | 86 | 101 | 100 | 67 | 81 |
| 1910 | 63 | 54 | 54 | 52 | 53 | 53 | 59 | 69 | 80 | 75 | 71 | 68 | 63 |
| 1911 | 59 | 55 | 67 | (²) | 72 | 80 | 81 | 70 | 91 | 94 | 76 | 63 | 73 |
| 1912 | 55 | 48 | 48 | 46 | 45 | 46 | 49 | 62 | 61 | 79 | 86 | 85 | 59 |
| 1913 | 88 | 91 | 96 | 96 | 99 | (²) | 112 | (²) | (²) | (²) | (²) | (²) | --- |
| 1914 | 58 | 64 | 74 | 77 | 72 | 66 | 64 | 67 | 65 | 61 | 58 | 59 | 66 |
| 1915 | 51 | 55 | 55 | 54 | 52 | 59 | 59 | 62 | 68 | 88 | 96 | 103 | 67 |
| 1916 | 131 | 118 | 136 | 139 | 149 | 178 | 212 | 188 | 224 | 251 | 243 | 207 | 181 |
| 1917 | 190 | 182 | 186 | 207 | 215 | 189 | 164 | 148 | 170 | 190 | 190 | 183 | 184 |
| 1918 | 166 | 146 | 146 | 151 | 143 | 150 | 166 | 192 | 197 | 202 | 135 | 131 | 160 |
| 1919 | 150 | 164 | 139 | 122 | 129 | 133 | 148 | 141 | 132 | 136 | 125 | 101 | 135 |
| 1920 | 78 | 66 | 55 | 51 | 48 | 45 | 58 | 63 | 68 | 63 | 63 | 57 | 59 |
| 1921 | 48 | 50 | 50 | 72 | 74 | 67 | 72 | 77 | 93 | 96 | 111 | 102 | 76 |
| 1922 | 100 | 91 | 89 | 90 | 93 | 96 | 99 | 94 | 84 | 83 | (²) | (²) | --- |
| 1923 | (²) | 71 | (²) | 68 | 67 | 73 | 62 | 85 | 94 | (²) | 113 | 89 | --- |
| 1924 | 88 | 98 | 109 | 103 | 93 | 92 | 97 | 105 | 113 | 116 | 107 | 100 | 101 |
| 1925 | 82 | 77 | 77 | 72 | 68 | 70 | 69 | 70 | 79 | 76 | 74 | 71 | 73 |
| 1926 | 64 | 64 | 63 | 63 | 65 | 69 | 79 | 102 | 110 | 97 | (²) | 70 | --- |
| 1927 | 69 | 71 | 74 | 81 | 88 | 90 | 92 | 91 | 92 | 83 | 89 | 83 | 82 |
| 1928 | 78 | 74 | 75 | 80 | 71 | 71 | 71 | 74 | 89 | 90 | 105 | 81 | 77 |
| 1929 | 77 | 73 | | | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from Kansas City Grain Market Review, formerly Daily Price Current. Quoted per 100 pounds; converted to bushels of 56 pounds.

¹ Average of daily prices weighted by car-lot sales.² No quotations.

COTTON, SUGAR, AND TOBACCO

TABLE 124.—*Cotton: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1929*

| Year | Acreage harvested | Average yield per acre | Production ¹ | Price per pound received by producers, Dec. 1 | Farm value Dec. 1 | Average price per pound, New York ² | Domestic exports, year beginning Aug. 1 ^{3,4} | Imports, year beginning Aug. 1 ⁵ | Net exports, year beginning Aug. 1 ^{6,7} |
|------|-------------------|------------------------|-------------------------|---|-------------------|--|--|---|---|
| | 1,000 acres | Lbs. | 1,000 bales | Cents | 1,000 dollars | Cents | 1,000 bales | 1,000 bales | 1,000 bales |
| 1849 | | | 2,489 | | | 12.34 | * 1,271 | * 1 | * 1,270 |
| 1859 | | | 5,587 | | | 11.00 | * 3,535 | * 4 | * 3,531 |
| 1866 | 7,599 | 129.0 | 1,750 | | | 31.59 | * 1,323 | * 2 | * 1,324 |
| 1867 | 7,828 | 189.8 | 2,340 | | | 24.85 | 1,511 | 2 | 1,510 |
| 1868 | 6,799 | 192.2 | 2,380 | | | 29.01 | 1,288 | * 6 | 1,284 |
| 1869 | | | 3,012 | | | 23.98 | | | |
| 1869 | 7,743 | 196.9 | 3,012 | | | 23.98 | 1,980 | 4 | 1,977 |
| 1870 | 8,885 | 198.9 | 3,800 | | | 16.95 | 2,894 | 3 | 2,893 |
| 1871 | 7,558 | 148.2 | 2,553 | | | 20.48 | 1,851 | 7 | 1,844 |
| 1872 | 8,483 | 188.7 | 3,920 | | | 18.15 | 2,437 | 11 | 2,426 |
| 1873 | 9,510 | 179.7 | 3,683 | | | 17.00 | 2,706 | 5 | 2,702 |
| 1874 | 11,764 | 147.5 | 3,941 | | | 15.00 | 2,523 | 5 | 2,520 |
| 1875 | 11,934 | 190.6 | 5,123 | | | 13.00 | 3,003 | 5 | 2,999 |
| 1876 | 11,677 | 167.8 | 4,438 | 9.0 | 174,724 | 11.73 | 2,869 | 6 | 2,864 |
| 1877 | 12,133 | 163.8 | 4,370 | | | 11.28 | 3,198 | 7 | 3,194 |
| 1878 | 12,344 | 191.2 | 5,244 | 8.2 | 192,515 | 10.83 | 3,265 | 6 | 3,259 |
| 1879 | 14,480 | 181.0 | 5,755 | 10.3 | 269,305 | 12.02 | 3,711 | 7 | 3,705 |
| 1880 | 15,951 | 184.5 | 6,343 | 9.8 | 289,083 | 11.34 | 4,409 | 9 | 4,403 |
| 1881 | 16,711 | 140.8 | 5,456 | | | 12.16 | 3,430 | 9 | 3,426 |
| 1882 | 16,277 | 185.7 | 6,957 | 9.1 | 275,513 | 10.63 | 4,582 | 9 | 4,577 |
| 1883 | 16,778 | 164.8 | 5,701 | 9.1 | 250,977 | 10.64 | 3,745 | 15 | 3,734 |
| 1884 | 17,440 | 153.8 | 5,682 | 9.2 | 246,575 | 10.54 | 3,740 | 10 | 3,733 |
| 1885 | 18,301 | 164.4 | 6,575 | 8.4 | 251,775 | 9.44 | 4,193 | 11 | 4,185 |
| 1886 | 18,455 | 169.5 | 6,446 | 8.1 | 251,856 | 10.25 | 4,274 | 9 | 4,266 |
| 1887 | 18,641 | 182.7 | 7,020 | 8.5 | 290,901 | 10.27 | 4,557 | 11 | 4,547 |
| 1888 | 19,059 | 180.4 | 6,941 | 8.5 | 292,139 | 10.71 | 4,720 | 17 | 4,704 |
| 1889 | 20,175 | 159.7 | 7,473 | 8.5 | 275,249 | 11.27 | 4,934 | 19 | 4,915 |
| 1890 | 19,512 | 187.0 | 8,074 | 8.6 | 313,360 | 9.48 | 5,859 | 45 | 5,815 |
| 1891 | 19,059 | 179.4 | 9,018 | 7.2 | 247,653 | 7.08 | 5,888 | 61 | 5,827 |
| 1892 | 15,911 | 209.2 | 6,664 | 8.3 | 277,194 | 8.45 | 4,156 | 90 | 4,367 |
| 1893 | 19,525 | 149.9 | 7,493 | 7.0 | 204,983 | 7.75 | 5,309 | 58 | 5,253 |
| 1894 | 23,688 | 195.3 | 9,476 | 4.6 | 212,335 | 6.38 | 7,010 | 104 | 6,908 |
| 1895 | 20,185 | 155.6 | 7,161 | 7.6 | 238,503 | 8.10 | 4,710 | 115 | 4,598 |
| 1896 | 23,273 | 184.9 | 8,533 | 6.7 | 286,169 | 7.71 | 6,172 | 119 | 6,055 |
| 1897 | 24,320 | 182.7 | 10,898 | 6.7 | 296,816 | 6.40 | 7,757 | 102 | 7,656 |
| 1898 | 24,967 | 220.6 | 11,189 | 5.7 | 315,449 | 6.00 | 7,062 | 105 | 7,557 |
| 1899 | 24,275 | | 9,345 | | | | | | |
| 1899 | 24,327 | 183.8 | 9,345 | 7.0 | 326,215 | 8.36 | 6,228 | 140 | 6,091 |
| 1900 | 24,933 | 194.4 | 10,123 | 9.2 | 463,310 | 9.38 | 6,800 | 109 | 6,692 |
| 1901 | 26,774 | 170.0 | 9,510 | 7.0 | 334,088 | 8.73 | 6,949 | 202 | 6,750 |
| 1902 | 27,175 | 187.3 | 10,631 | 7.6 | 403,718 | 9.96 | 7,084 | 151 | 6,930 |
| 1903 | 27,052 | 174.3 | 9,851 | 10.5 | 516,763 | 12.84 | 6,207 | 103 | 6,107 |
| 1904 | 31,215 | 205.9 | 15,458 | 9.0 | 603,438 | 9.09 | 8,908 | 129 | 8,781 |
| 1905 | 27,110 | 186.6 | 10,675 | 10.8 | 569,791 | 11.30 | 7,118 | 144 | 6,980 |
| 1906 | 31,374 | 202.5 | 15,874 | 9.6 | 635,534 | 11.24 | 8,943 | 227 | 8,741 |
| 1907 | 29,660 | 179.1 | 11,107 | 10.4 | 575,226 | 11.53 | 7,666 | 153 | 7,518 |
| 1908 | 32,444 | 194.9 | 15,842 | 8.7 | 575,092 | 10.23 | 8,955 | 181 | 8,778 |
| 1909 | 32,044 | | 10,005 | | | | | | |
| 1909 | 30,938 | 154.3 | 10,005 | 13.9 | 607,681 | 14.66 | 6,353 | 170 | 6,194 |

¹ 500-pound gross weight bales, from 1890–1927.

² Compiled from Cotton Fluctuation, 1849–1888, and are averages for crop year beginning September. From New York Commercial and Financial Chronicle, 1889–1890, and from reports of New York Cotton Exchange since 1900. Since 1889 the averages are for crop year beginning August.

³ Excluding linters from 1914 to 1929.

⁴ Compiled from Commerce and Navigation of the United States, 1849–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June and July, 1919–1929, and January 1927 and 1929.

⁵ Bales of 500 pounds gross weight.

⁶ Bales of 478 pounds net, which are equivalent to bales of 500 pounds gross weight.

⁷ Total exports (domestic plus foreign) minus imports.

⁸ Year beginning July 1.

⁹ Estimated from value of imports. Average import price per pound calculated by assuming that the percentage change in import price from the previous year is equal to the percentage change in the export prices.

TABLE 124.—*Cotton: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866-1929—Continued*

| Year | Acreage harvested | Average yield per acre | Production | Price per pound received by producers, Dec. 1 | Farm value Dec. 1 | Average price per pound, New York | Domestic exports, year beginning Aug. 1 | Imports, year beginning Aug. 1 | Net exports, year beginning Aug. 1 |
|--------------------------|--------------------|------------------------|--------------------|---|----------------------|-----------------------------------|---|--------------------------------|------------------------------------|
| | <i>1,000 acres</i> | <i>Lbs.</i> | <i>1,000 bales</i> | <i>Cents</i> | <i>1,000 dollars</i> | <i>Cents</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> |
| 1910..... | 32,403 | 170.7 | 11,609 | 14.1 | 820,407 | 14.87 | 8,027 | 245 | 7,787 |
| 1911..... | 36,045 | 207.7 | 15,693 | 8.8 | 687,888 | 10.85 | 11,116 | 233 | 10,885 |
| 1912..... | 34,283 | 190.9 | 13,703 | 11.9 | 817,055 | 12.29 | 9,146 | 249 | 8,899 |
| 1913..... | 37,089 | 182.0 | 14,156 | 12.2 | 862,708 | 13.21 | 9,508 | 273 | 9,231 |
| 1914..... | 36,832 | 209.2 | 16,155 | 6.8 | 549,036 | ¹⁰ 8.89 | 8,702 | 400 | 8,322 |
| 1915..... | 31,412 | 170.3 | 11,198 | 11.3 | 631,460 | 11.98 | 6,113 | 458 | 5,673 |
| 1916..... | 34,985 | 156.6 | 11,450 | 19.6 | 1,122,295 | 19.28 | 5,525 | 311 | 5,219 |
| 1917..... | 33,841 | 159.7 | 11,502 | 27.7 | 1,566,198 | 29.68 | 4,402 | 231 | 4,175 |
| 1918..... | 36,008 | 159.6 | 12,041 | 27.6 | 1,663,633 | 31.01 | 5,774 | 211 | 5,568 |
| 1919..... | 33,740 | | 11,421 | | | | | | |
| 1919..... | 33,566 | 161.5 | 11,421 | 35.6 | 2,034,658 | 38.29 | 6,707 | 732 | 5,998 |
| 1920..... | 35,878 | 178.4 | 13,440 | 13.9 | 933,658 | 17.89 | 5,973 | 237 | 5,733 |
| 1921..... | 30,509 | 124.5 | 7,954 | 16.2 | 643,933 | 18.92 | 6,348 | 380 | 5,968 |
| 1922..... | 33,036 | 141.2 | 11,755 | 23.8 | 1,160,968 | 26.24 | 5,007 | 492 | 4,536 |
| 1923..... | 37,123 | 130.6 | 10,140 | 31.0 | 1,571,829 | 31.11 | 5,815 | 306 | 5,530 |
| 1924..... | 39,204 | | 13,628 | | | | | | |
| 1924..... | 41,360 | 157.4 | 13,628 | 22.6 | 1,540,884 | 24.74 | 8,240 | 328 | 7,923 |
| 1925..... | 46,053 | 167.2 | 16,104 | 18.2 | 1,464,032 | 20.53 | 8,267 | 340 | 7,939 |
| 1926..... | 47,087 | 182.6 | 17,977 | 10.9 | 982,736 | 15.15 | 11,299 | 419 | 10,900 |
| 1927..... | 40,138 | 154.5 | 12,955 | 19.6 | 1,269,885 | 20.42 | 7,859 | 354 | 7,524 |
| 1928..... | 45,341 | 152.9 | 14,478 | 18.0 | 1,301,796 | 19.73 | 8,419 | 479 | 7,957 |
| 1929 ¹² | 45,981 | 155.3 | 14,919 | 16.4 | 1,225,032 | | | | |

Bureau of Agricultural Economics; italic figures are census returns; other acreage, yield, and production figures are estimates by the crop-reporting board; acreage revised on census basis.

¹⁰ Average for nine months only. Exchange closed August-Nov. 17, on account of war.

¹¹ Cotton ginned in the United States. Prior census reports include undetermined quantities Lower California cotton ginned in the United States. In later years no Lower California cotton ginned in the United States.

¹² Preliminary.

TABLE 125.—*Cotton: Acreage in cultivation and acreage abandoned, by States, averages, and annual 1924-1929*

| State | Acreage in cultivation June 25 | | | | | | | Acreage abandoned after June 25 | | | | | | |
|---------------------|--------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------------------|---------------|---------------|---------------|---------------|-------------------|--------------------|
| | Average, 1923-1927 | 1924 | 1925 | 1926 | 1927 | 1928 ¹ | 1929 ¹² | Average, 1918-1927 | 1924 | 1925 | 1926 | 1927 | 1928 ¹ | 1929 ¹² |
| | | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | | <i>P. ct.</i> | <i>P. ct.</i> | <i>P. ct.</i> | <i>P. ct.</i> | <i>P. ct.</i> | <i>P. ct.</i> |
| Missouri..... | 447 | 524 | 542 | 472 | 305 | 355 | 350 | 5.0 | 6.0 | 4.0 | 8.0 | 4.5 | 6.0 | 2.0 |
| Virginia..... | 88 | 107 | 101 | 95 | 65 | 81 | 89 | 2.1 | 4.7 | 1.0 | 2.0 | 2.0 | 2.0 | 1.3 |
| North Carolina..... | 1,917 | 2,099 | 2,037 | 2,015 | 1,749 | 1,892 | 1,818 | 1.6 | 4.5 | 1.0 | 1.5 | 1.2 | 1.7 | 2.0 |
| South Carolina..... | 2,475 | 2,491 | 2,708 | 2,716 | 2,454 | 2,485 | 2,228 | 2.3 | 3.5 | 2.0 | 2.5 | 4.0 | 5.0 | 2.0 |
| Georgia..... | 3,626 | 3,099 | 3,662 | 4,025 | 3,501 | 3,883 | 3,847 | 3.6 | 1.7 | 2.0 | 1.5 | 2.5 | 4.0 | 1.7 |
| Florida..... | 106 | 82 | 103 | 108 | 67 | 101 | 97 | 5.5 | 3.0 | 1.5 | 3.0 | 4.0 | 6.0 | 1.8 |
| Tennessee..... | 1,118 | 1,016 | 1,191 | 1,178 | 985 | 1,145 | 1,137 | 2.4 | 2.0 | 1.5 | 3.0 | 2.0 | 3.3 | 1.5 |
| Alabama..... | 3,351 | 3,114 | 3,539 | 3,699 | 3,214 | 3,643 | 3,633 | 1.8 | 1.9 | 1.0 | 1.3 | 1.5 | 3.0 | 1.2 |
| Mississippi..... | 3,433 | 3,057 | 3,501 | 3,809 | 3,408 | 4,154 | 4,133 | 2.8 | 2.5 | 1.0 | 1.5 | 2.0 | 3.0 | 1.5 |
| Arkansas..... | 3,423 | 3,173 | 3,814 | 3,867 | 3,142 | 3,834 | 3,900 | 2.4 | 2.5 | 2.0 | 2.0 | 3.0 | 4.0 | 1.7 |
| Louisiana..... | 1,727 | 1,666 | 1,903 | 2,019 | 1,585 | 2,052 | 2,079 | 3.5 | 3.0 | 1.5 | 2.0 | 2.7 | 3.0 | 1.4 |
| Oklahoma..... | 4,402 | 4,022 | 5,320 | 5,063 | 4,187 | 4,420 | 4,655 | 6.9 | 4.0 | 2.0 | 8.0 | 14.0 | 4.0 | 3.5 |
| Texas..... | 17,455 | 17,706 | 19,139 | 19,140 | 16,850 | 18,330 | 18,912 | 4.2 | 3.0 | 8.0 | 4.0 | 4.0 | 3.2 | 5.5 |
| New Mexico..... | 112 | 126 | 138 | 125 | 100 | 123 | 132 | 13.2 | 20.0 | 23.0 | 4.0 | 5.0 | 5.0 | 1.5 |
| Arizona..... | 157 | 182 | 162 | 168 | 140 | 202 | 227 | 2.4 | 1.6 | 0 | 0.0 | 0.7 | 1.0 | 0.5 |
| California..... | 137 | 130 | 171 | 167 | 130 | 223 | 317 | 2.2 | 0 | 1.0 | 3.0 | 1.5 | 2.2 | 2.5 |
| All other..... | 37 | 46 | 59 | 44 | 23 | 23 | 15 | ----- | 10.8 | 3.4 | 2.3 | 5.0 | 5.0 | 0 |
| United States..... | 44,013 | 42,641 | 48,060 | 48,730 | 41,905 | 46,946 | 47,569 | 3.6 | 3.0 | 4.2 | 3.4 | 4.2 | 3.4 | 3.3 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ In cultivation July 1.

¹² Preliminary.

³ Abandoned after July 1.

⁴ 5-year average.

TABLE 126.—*Cotton: Acreage harvested, by States, 1917-1929*

| State | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ¹ |
|---------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> |
| Missouri..... | 153 | 148 | 125 | 136 | 103 | 198 | 355 | 493 | 520 | 434 | 291 | 334 | 343 |
| Virginia..... | 50 | 44 | 42 | 42 | 34 | 55 | 74 | 102 | 100 | 93 | 64 | 79 | 88 |
| North Carolina..... | 1,515 | 1,600 | 1,490 | 1,587 | 1,403 | 1,625 | 1,679 | 2,005 | 2,017 | 1,985 | 1,728 | 1,860 | 1,782 |
| South Carolina..... | 2,837 | 3,001 | 2,835 | 2,964 | 2,571 | 1,912 | 1,965 | 2,404 | 2,654 | 2,648 | 2,356 | 2,361 | 2,183 |
| Georgia..... | 5,195 | 5,341 | 5,220 | 4,900 | 4,172 | 3,418 | 3,421 | 3,046 | 3,589 | 3,965 | 3,413 | 3,728 | 3,782 |
| Florida..... | 183 | 167 | 103 | 100 | 65 | 118 | 147 | 80 | 101 | 105 | 64 | 95 | 95 |
| Tennessee..... | 882 | 902 | 758 | 810 | 634 | 985 | 1,172 | 996 | 1,173 | 1,143 | 965 | 1,107 | 1,120 |
| Alabama..... | 1,977 | 2,570 | 2,791 | 2,858 | 2,235 | 2,771 | 3,070 | 3,055 | 3,504 | 3,651 | 3,166 | 3,534 | 3,589 |
| Mississippi..... | 2,788 | 3,138 | 2,818 | 2,950 | 2,628 | 3,014 | 3,170 | 2,981 | 3,466 | 3,752 | 3,340 | 4,029 | 4,071 |
| Arkansas..... | 2,740 | 2,991 | 2,725 | 2,980 | 2,382 | 2,799 | 3,026 | 3,094 | 3,738 | 3,790 | 3,048 | 3,681 | 3,834 |
| Louisiana..... | 1,454 | 1,683 | 1,527 | 1,470 | 1,168 | 1,140 | 1,405 | 1,616 | 1,874 | 1,979 | 1,542 | 1,990 | 2,050 |
| Oklahoma..... | 2,783 | 2,998 | 2,424 | 2,749 | 2,206 | 2,915 | 3,197 | 3,861 | 5,214 | 4,676 | 3,601 | 4,243 | 4,492 |
| Texas..... | 11,092 | 11,233 | 10,476 | 11,898 | 10,745 | 11,874 | 14,150 | 17,175 | 17,608 | 18,374 | 16,179 | 17,743 | 17,872 |
| New Mexico..... | | | | | | 28 | 60 | 101 | 107 | 120 | 95 | 117 | 130 |
| Arizona..... | 41 | 95 | 107 | 230 | 90 | 101 | 127 | 180 | 162 | 167 | 139 | 200 | 226 |
| California..... | 136 | 85 | 85 | 150 | 55 | 97 | 83 | 130 | 169 | 162 | 128 | 218 | 309 |
| All other..... | 15 | 12 | 10 | 24 | 18 | 16 | 13 | 41 | 57 | 43 | 22 | 22 | 15 |
| United States..... | 33,841 | 36,008 | 33,566 | 35,878 | 30,509 | 33,036 | 37,123 | 41,360 | 46,053 | 47,087 | 40,138 | 45,341 | 45,981 |
| Lower California (old Mexico)..... | | 88 | 100 | 125 | 85 | 135 | 150 | 137 | 150 | 130 | 110 | 160 | 147 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.TABLE 127.—*Cotton: Yield per acre and estimated price per pound, December 1, by States, averages and annual 1924-1929*

| State | Yield per acre | | | | | | | Estimated price per pound | | | | | | |
|---------------------|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Av. 1918- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Av. 1923- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| Missouri..... | 248 | 185 | 275 | 240 | 188 | 210 | 300 | 19.6 | 23.0 | 12.0 | 10.0 | 20.5 | 18.0 | 16.7 |
| Virginia..... | 246 | 180 | 250 | 264 | 230 | 265 | 250 | 21.1 | 23.0 | 19.0 | 11.4 | 20.0 | 18.2 | 17.0 |
| North Carolina..... | 260 | 196 | 261 | 292 | 238 | 215 | 197 | 20.7 | 22.6 | 19.0 | 11.5 | 19.5 | 18.5 | 16.7 |
| South Carolina..... | 185 | 160 | 160 | 182 | 148 | 147 | 185 | 20.8 | 22.1 | 18.8 | 11.7 | 19.6 | 18.4 | 16.4 |
| Georgia..... | 140 | 157 | 155 | 180 | 154 | 132 | 170 | 20.8 | 22.4 | 19.0 | 11.1 | 19.4 | 18.2 | 15.8 |
| Florida..... | 105 | 130 | 180 | 145 | 126 | 97 | 145 | 19.9 | 22.5 | 18.8 | 10.2 | 19.1 | 17.9 | 16.7 |
| Tennessee..... | 181 | 170 | 210 | 188 | 178 | 185 | 220 | 20.1 | 23.2 | 16.2 | 10.0 | 19.0 | 18.0 | 16.5 |
| Alabama..... | 145 | 154 | 185 | 196 | 180 | 150 | 178 | 20.6 | 22.7 | 18.9 | 10.7 | 19.0 | 18.5 | 17.2 |
| Mississippi..... | 177 | 176 | 275 | 241 | 194 | 175 | 225 | 21.6 | 23.7 | 19.5 | 11.6 | 20.5 | 18.5 | 17.2 |
| Arkansas..... | 166 | 169 | 205 | 195 | 157 | 162 | 186 | 20.4 | 22.8 | 16.1 | 11.0 | 20.2 | 18.2 | 16.7 |
| Louisiana..... | 152 | 145 | 232 | 200 | 170 | 166 | 189 | 20.2 | 22.4 | 18.1 | 11.0 | 19.2 | 17.9 | 16.6 |
| Oklahoma..... | 148 | 137 | 155 | 181 | 138 | 138 | 128 | 19.7 | 22.2 | 17.0 | 9.7 | 19.8 | 17.2 | 15.7 |
| Texas..... | 133 | 138 | 113 | 147 | 120 | 138 | 106 | 20.3 | 22.4 | 18.5 | 10.8 | 19.3 | 17.5 | 16.0 |
| New Mexico..... | 1 276 | 266 | 298 | 290 | 352 | 380 | 300 | 21.6 | 25.0 | 21.5 | 12.3 | 19.8 | 19.5 | 17.7 |
| Arizona..... | 283 | 285 | 350 | 349 | 315 | 357 | 330 | 24.2 | 26.4 | 20.5 | 13.3 | 25.6 | 23.5 | 22.5 |
| California..... | 282 | 284 | 340 | 387 | 340 | 378 | 375 | 22.6 | 24.0 | 22.0 | 14.0 | 21.0 | 19.5 | 18.0 |
| United States..... | 155.8 | 157.4 | 167.2 | 182.0 | 154.5 | 152.9 | 155.3 | 20.5 | 22.6 | 18.2 | 10.9 | 19.6 | 18.0 | 16.4 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ 6-year average.

TABLE 128.—Cotton: Production of lint in 500-pound gross-weight bales, by States, and linters, United States, 1917-1929

| State | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ¹ |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------|
| | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales |
| Missouri..... | 61 | 62 | 64 | 79 | 70 | 2 149 | 2 127 | 2 193 | 2 299 | 218 | 115 | 147 | 215 |
| Virginia..... | 19 | 25 | 23 | 21 | 16 | 27 | 51 | 39 | 53 | 51 | 31 | 44 | 46 |
| North Carolina..... | 618 | 898 | 830 | 925 | 776 | 852 | 1,020 | 825 | 1,102 | 1,213 | 861 | 836 | 735 |
| South Carolina..... | 1,237 | 1,570 | 1,426 | 1,623 | 755 | 493 | 770 | 807 | 889 | 1,008 | 730 | 726 | 845 |
| Georgia..... | 1,884 | 2,122 | 1,660 | 1,415 | 787 | 715 | 588 | 2 1,002 | 1,164 | 1,496 | 1,100 | 1,030 | 1,345 |
| Florida..... | 38 | 29 | 16 | 18 | 11 | 25 | 12 | 2 22 | 38 | 32 | 2 17 | 19 | 29 |
| Tennessee..... | 241 | 330 | 310 | 325 | 302 | 391 | 2 226 | 2 354 | 2 515 | 2 451 | 2 359 | 2 428 | 615 |
| Alabama..... | 518 | 801 | 713 | 663 | 580 | 824 | 587 | 2 985 | 1,357 | 1,498 | 1,191 | 1,109 | 1,335 |
| Mississippi..... | 906 | 1,226 | 961 | 895 | 813 | 989 | 604 | 1,099 | 1,991 | 1,888 | 1,355 | 1,475 | 1,915 |
| Arkansas..... | 974 | 987 | 884 | 1,214 | 797 | 2 1,011 | 2 622 | 2 1,094 | 2 1,600 | 1,548 | 1,000 | 1,246 | 1,490 |
| Louisiana..... | 639 | 588 | 298 | 388 | 270 | 343 | 368 | 493 | 910 | 829 | 548 | 691 | 810 |
| Oklahoma..... | 959 | 577 | 1,016 | 1,336 | 481 | 627 | 656 | 1,511 | 1,691 | 1,773 | 1,037 | 1,205 | 1,800 |
| Texas..... | 3,125 | 2,697 | 3,069 | 4,345 | 2,198 | 3,222 | 2 4,340 | 2 4,949 | 2 4,163 | 5,628 | 2 4,352 | 2 5,106 | 3,950 |
| New Mexico..... | | | | | 10 | 6 | 12 | 2 30 | 2 57 | 2 60 | 2 75 | 2 70 | 2 88 |
| Arizona..... | 22 | 56 | 60 | 103 | 45 | 47 | 78 | 108 | 119 | 2 122 | 2 91 | 2 149 | 156 |
| California..... | 58 | 67 | 56 | 75 | 34 | 21 | 54 | 77 | 122 | 131 | 91 | 172 | 242 |
| All other..... | 6 | 6 | 5 | 3 | 3 | 7 | 2 8 | 2 14 | 2 26 | 2 17 | 2 7 | 2 7 | 7 |
| United States..... | 11,302 | 12,041 | 11,421 | 13,440 | 7,954 | 9,755 | 10,140 | 13,628 | 16,104 | 17,977 | 12,955 | 14,478 | 14,919 |
| Linters, total U. S. 3..... | 1,126 | 930 | 608 | 440 | 398 | 608 | 669 | 897 | 1,115 | 1,158 | 1,016 | | |

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census.

¹ Preliminary estimate of the Department of Agriculture.² Slight differences from census figures on ginnings are due to ginnings in one State of cotton grown in another.³ Year beginning Aug. 1.

TABLE 129.—Cotton: Acreage and yield of lint per acre in specified countries, average 1909-10 to 1913-14, 1921-22 to 1925-26, annual 1926-27 to 1929-30

| Country | Acreage | | | | | Yield of lint per acre | | | | | | |
|--|-----------------------------|-----------------------------|----------------|----------------|----------------|------------------------|-----------------------------|-----------------------------|---------|---------|---------|---------------------|
| | Average, 1909-10 to 1913-14 | Average, 1921-22 to 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30 preliminary | Average, 1909-10 to 1913-14 | Average, 1921-22 to 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30 preliminary |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. |
| United States..... | 34,152 | 37,616 | 47,087 | 40,138 | 45,341 | 45,981 | 182 | 146 | 183 | 155 | 153 | 155 |
| India..... | 22,503 | 23,818 | 24,822 | 24,761 | 26,484 | 23,536 | 76 | 91 | 81 | 96 | 85 | 90 |
| Egypt..... | 1,743 | 1,768 | 1,854 | 1,574 | 1,805 | 1,912 | 399 | 368 | 400 | 382 | 431 | 411 |
| China..... | 4,498 | 4,152 | 4,192 | 4,265 | 4,265 | 4,265 | | 215 | 201 | 214 | 207 | |
| Brazil..... | 1,887 | 1,475 | 986 | 1,297 | 1,284 | 2,559 | 209 | 184 | 235 | 186 | 189 | |
| Russia (Asiatic)..... | 1,569 | 741 | 1,620 | 1,858 | 2,270 | 2,559 | 276 | 197 | 228 | 256 | 260 | 248 |
| Mexico..... | 253 | 330 | 613 | 326 | 523 | 475 | 353 | 267 | 281 | 263 | 245 | 237 |
| Chosen (Korea)..... | 140 | 405 | 529 | 503 | 503 | 459 | 67 | 128 | 129 | 126 | 142 | 151 |
| Uganda..... | 58 | 420 | 570 | 533 | 699 | 684 | 169 | 122 | 92 | 104 | 112 | |
| Peru..... | 2 163 | 284 | 316 | 316 | 284 | | | 343 | 372 | 372 | | |
| Anglo Egyptian Sudan..... | 44 | 134 | 225 | 239 | 285 | 373 | 158 | 163 | 279 | 221 | 238 | 207 |
| Argentina..... | 5 | 156 | 177 | 210 | | | 221 | 188 | 163 | 231 | | |
| Total above countries excluding China, reporting 1926-27 to 1928-29..... | | | 78,306 | 71,229 | 79,194 | | | | | | | |
| Estimated world total, excluding China..... | 62,500 | 69,000 | 80,900 | 73,800 | 81,800 | | | | | | | |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Data for crop year as given at the head of the table are for crops harvested between Aug. 1 and July 31 of the following year. This applies to both Northern and Southern Hemispheres. For the United States prior to 1914 the figures apply to the harvest year beginning Sept. 1.

¹ Average for 3 years.² Average 1914-15 to 1918-19.

TABLE 130.—Cotton: Production of lint in specified countries, average 1909-10 to 1913-14, 1921-22 to 1925-26, annual 1925-26 to 1929-30

| Country | Year beginning Aug. 1 | | | | | | |
|--|-----------------------------------|-----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| | Average, 1909-10 to 1913-14 | Average, 1921-22 to 1925-26 | 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30, prelimi- nary |
| NORTH AMERICA | | | | | | | |
| United States ¹ | Bales ¹ 13,033,000 | Bales ¹ 11,516,000 | Bales ¹ 16,104,000 | Bales ¹ 17,977,000 | Bales ¹ 12,955,000 | Bales ¹ 14,478,000 | Bales ¹ 14,919,000 |
| Mexico | 187,000 | 184,152 | 200,476 | 359,820 | 179,000 | 268,637 | ² 235,442 |
| Total North American countries reporting 1925-26 to 1928-29 | | | 16,304,476 | 18,336,820 | 13,134,000 | 14,746,637 | |
| SOUTH AND CENTRAL AMERICA AND WEST INDIES | | | | | | | |
| Venezuela | | ⁴ 37,093 | 32,000 | 32,000 | 32,000 | 32,285 | |
| Colombia | | ⁵ 14,184 | 15,912 | 24,906 | 11,207 | | |
| Peru | 110,000 | 202,591 | 204,308 | 246,168 | 245,615 | ³ 200,000 | ³ 210,000 |
| Ecuador | ⁶ 297 | 7,320 | ³ 6,100 | ³ 6,340 | ³ 5,800 | ³ 5,097 | |
| Brazil | 387,000 | 567,931 | 601,520 | 484,237 | 505,049 | ³ 506,618 | |
| Paraguay | ⁷ 92 | 9,686 | 11,481 | 10,625 | | ³ 40,000 | |
| Argentina | 2,314 | 61,105 | 133,844 | 60,419 | 101,467 | ³ 180,000 | |
| Guatemala | ⁸ 75 | 847 | 1,650 | 260 | | | |
| Haiti ⁶ | 9,300 | 18,445 | 23,035 | 22,604 | 20,419 | 21,929 | |
| Dominican Republic ⁶ | ⁷ 992 | 515 | 640 | 414 | 273 | 76 | |
| Porto Rico | ⁸ 1,319 | 1,356 | 1,891 | 1,373 | 960 | 1,335 | |
| Salvador ⁶ | | ⁹ 6,529 | 2,461 | 229 | | | |
| British West Indies | 6,058 | 4,451 | 3,876 | 4,281 | 4,245 | 2,500 | |
| Total South and Central American countries and West Indies reporting 1925-26 to 1928-29 | | | 1,007,214 | 857,836 | 915,828 | 949,840 | |
| EUROPE | | | | | | | |
| Italy | 5,212 | ⁴ 4,707 | | | | | |
| Yugoslavia | 922 | 333 | 580 | 385 | 189 | 218 | 345 |
| Greece | 16,770 | 10,746 | 14,609 | 17,759 | 12,571 | 14,875 | |
| Bulgaria | 842 | 1,686 | 2,068 | 2,309 | 3,457 | 4,344 | 4,400 |
| Malta | 433 | 377 | 655 | 424 | 287 | 453 | |
| Spain | | ⁶ 698 | 1,108 | 3,599 | 2,553 | 3,078 | |
| Total European countries reporting 1925-26 to 1928-29 | | | 19,020 | 24,476 | 19,057 | 22,968 | |
| AFRICA | | | | | | | |
| Algeria | ¹ 1,370 | 1,917 | 5,583 | 7,642 | 4,086 | 6,164 | 8,000 |
| Morocco (French) | | ⁹ 275 | 415 | 738 | 369 | 323 | |
| French West Africa: | | | | | | | |
| Dahomey | ⁶ 664 | 2,939 | 6,549 | 4,718 | 3,920 | | |
| Ivory Coast ⁶ | ⁹ 212 | 2,498 | 6,314 | 6,743 | 5,457 | | |
| French Guinea | ⁶ 167 | 707 | 2,237 | 2,315 | 2,306 | 1,845 | |
| Senegal | | 1,677 | 1,665 | 2,629 | 2,306 | 4,243 | |
| French Sudan | | ⁸ 4,843 | 6,065 | 1,753 | 3,920 | | |
| Upper Volta | | ⁷ 7,124 | 12,683 | 3,044 | 4,059 | 4,704 | |
| French Togo | ⁹ 2,312 | 5,254 | 5,677 | 7,661 | | | |
| Nigeria | 8,702 | 24,185 | 40,091 | 22,982 | 17,498 | 28,452 | |
| French Equatorial Africa | | ⁸ 1,170 | | | | | |
| Egypt | 1,453,000 | 1,360,600 | 1,650,000 | 1,586,000 | 1,257,000 | 1,628,000 | 1,642,000 |
| Anglo-Egyptian Sudan | 14,455 | 45,836 | 106,460 | 131,007 | 111,000 | 141,747 | 161,425 |
| Italian Somaliland | ⁶ 510 | 1,576 | 2,537 | 2,767 | 3,828 | 7,034 | 8,000 |
| Eritrea | 948 | ⁸ 1,373 | 1,845 | 2,767 | 1,384 | 1,845 | |
| Gold Coast | 104 | 690 | | 84 | 84 | | |
| Belgian Congo | | 11,459 | 16,142 | 22,539 | 27,557 | | |
| Kenya | 552 | 1,347 | 1,712 | 1,031 | 544 | | |
| Uganda | 20,338 | 107,419 | 151,344 | 110,231 | 116,000 | 164,000 | |
| Tanzania | ⁶ 7,971 | 11,122 | 18,179 | 20,318 | 18,467 | 22,931 | |

¹ Bales of 478 pounds net.² Linters not included. Production of linters during this period has been: Average 1909-10 to 1913-14, 502,711 bales; 1925-26, 1,114,877 bales; 1926-27, 1,157,861 bales; 1927-28, 1,010,375 bales; 1928-29, 1,282,061 bales.³ From an unofficial source.⁴ Average for 3 years.⁵ Average for 4 years.⁶ Exports.⁷ For season 1915-16.⁸ For 1 year only.⁹ Average for 2 years.

TABLE 130.—*Cotton: Production of lint in specified countries, average 1909-10 to 1913-14, 1921-22 to 1925-26, annual 1925-26 to 1929-30—Continued*

| Country | Year beginning Aug. 1 | | | | | | |
|---|-----------------------------------|-----------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|------------------------------|
| | Average, 1909-10 to 1913-14 | Average, 1921-22 to 1925-26 | 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30, prelimi- nary |
| | <i>Bales</i> ¹ | <i>Bales</i> ¹ | <i>Bales</i> ¹ | <i>Bales</i> ¹ | <i>Bales</i> ¹ | <i>Bales</i> ¹ | <i>Bales</i> ¹ |
| Nyasaland..... | 4,603 | 4,751 | 6,459 | 4,165 | 2,336 | 3,740 | |
| Northern Rhodesia..... | 4,307 | 274 | 414 | 80 | 44 | | |
| Southern Rhodesia..... | | ² 2,007 | 5,160 | 461 | 72 | 300 | |
| Mozambique..... | ³ 388 | 2,645 | 2,230 | 11,952 | 14,732 | 5,650 | |
| Union of South Africa..... | 76 | 9,150 | 17,055 | 8,571 | 9,216 | 10,230 | |
| Total African countries reporting 1925-26 to 1929-29..... | | | 2,023,883 | 1,917,589 | 1,564,659 | 2,031,208 | |
| ASIA | | | | | | | |
| Cyprus..... | 1,938 | 1,994 | 2,556 | 3,598 | 1,766 | 1,796 | |
| Turkey, Asiatic..... | ⁴ 102,116 | 64,280 | 106,172 | 97,000 | 179,412 | | |
| Syria and Lebanon..... | | 7,301 | 13,421 | 7,760 | 10,700 | 4,174 | 7,000 |
| Russia, Asiatic..... | 904,906 | 306,968 | 781,757 | 773,916 | 993,915 | 1,232,362 | 1,325,000 |
| Iraq..... | | 1,071 | 2,125 | 2,929 | 1,500 | 4,300 | 6,695 |
| Persia ⁵ | ⁶ 136,000 | ⁷ 71,402 | 83,632 | 84,610 | 75,007 | ⁸ 120,503 | |
| India..... | 3,585,000 | 4,522,600 | 5,201,000 | 4,205,000 | 4,990,000 | 4,718,000 | 4,452,000 |
| China ¹⁰ | 694,600 | 2,021,000 | 2,102,000 | 1,742,000 | 1,875,000 | 1,844,000 | |
| Japanese Empire: | | | | | | | |
| Japan..... | 4,704 | 2,459 | 1,561 | 1,123 | 1,100 | | |
| Chosen (Korea)..... | 20,392 | 108,580 | 123,214 | 142,694 | 133,000 | 150,000 | 145,392 |
| French Indo-China..... | ⁹ 13,800 | ¹¹ 9,279 | ¹² 5,667 | ¹³ 3,285 | ¹⁴ 4,536 | 2,988 | |
| Dutch East Indies ¹⁵ | ¹⁶ 18,242 | 6,649 | ¹⁷ 5,469 | 4,398 | 5,500 | 4,262 | |
| Siam..... | ¹⁸ 3,653 | 4,136 | 4,624 | 2,747 | 2,885 | | |
| Total Asiatic countries reporting 1925-26 to 1929-29..... | | | 8,320,841 | 6,970,180 | 8,090,924 | 8,062,385 | |
| OCEANIA | | | | | | | |
| Australia..... | 75 | 7,920 | 5,692 | 4,431 | 8,591 | 8,240 | 5,060 |
| New Hebrides..... | ¹⁹ 547 | 2,436 | 3,821 | 2,348 | 2,582 | | |
| Total Oceania reporting 1925-26 to 1929-29..... | | 7,920 | 5,692 | 4,431 | 8,591 | 8,240 | |
| Total all countries re- porting 1925-26 to 1929-29..... | | | 27,681,126 | 28,111,332 | 23,733,059 | 25,841,278 | |
| Estimated world total, including China..... | 20,900,000 | 21,500,000 | 27,900,000 | 28,300,000 | 23,800,000 | 25,900,000 | |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Data for crop year as given at the head of the table are for crops harvested between Aug. 1 and July 31 of the following year. For the United States prior to 1914 the figures apply to the year beginning Sept. 1.

¹ Bales of 478 pounds net.

² From an unofficial source.

³ Average for 3 years.

⁴ Average for 4 years.

⁵ Exports.

⁶ For 1 year only.

⁷ Average for 2 years.

¹⁰ For 1921-22 to 1929-29, Chinese Economic Bulletin quoting the Chinese Mill Owners' Association. The figures represent the crop in the most important Provinces where the commercial crop is grown. The average 1909-10 to 1913-14 is the commercial crop of China as estimated by the United States Bureau of the Census.

¹¹ Annam, Cambodia, and Cochin-China only.

¹² Annam, Cambodia, Cochin-China, and Laos.

¹³ Includes Java and Madura and the outer possessions.

¹⁴ Java and Madura only.

TABLE 131.—Cotton: World production of lint, 1909-10 to 1929-30

| Year | Estimated world total, excluding China | Estimated world total, including China | Principal producing countries | | | | | | Estimated world total commercial crop ¹ |
|----------------------|--|--|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
| | | | United States | India | Egypt | China ¹ | Brazil | Russia (Asiatic) | |
| | 1,000 bales ² | 1,000 bales ³ | 1,000 bales ³ | 1,000 bales ³ | 1,000 bales ³ | 1,000 bales ³ | 1,000 bales ³ | 1,000 bales ³ | 1,000 bales ⁴ |
| 1909-10 | 16,800 | 10,005 | 3,998 | 1,036 | | | | 817 | 20,850 |
| 1910-11 | 18,460 | 11,609 | 3,254 | 1,555 | | | | 1,006 | 18,856 |
| 1911-12 | 21,99 ⁵ | 15,693 | 2,730 | 1,530 | | | 360 | 969 | 22,247 |
| 1912-13 | 21,190 | 13,703 | 3,702 | 1,554 | | | 418 | 946 | 21,550 |
| 1913-14 | 22,350 | 14,156 | 4,239 | 1,588 | | | 477 | 1,104 | 22,612 |
| 1914-15 | 24,270 | 16,135 | 4,359 | 1,337 | | | 465 | 1,270 | 24,964 |
| 1915-16 | 17,750 | 11,192 | 3,128 | 989 | | | 339 | 1,512 | 18,410 |
| 1916-17 | 18,370 | 19,910 | 11,450 | 3,759 | 1,048 | 1,534 | 337 | 1,199 | 18,924 |
| 1917-18 | 17,660 | 19,750 | 11,302 | 3,393 | 1,304 | 2,092 | 414 | 634 | 18,140 |
| 1918-19 | 17,790 | 20,850 | 12,041 | 3,328 | 999 | 3,059 | 406 | 161 | 18,755 |
| 1919-20 | 18,730 | 21,330 | 11,421 | 4,853 | 1,155 | 2,599 | 461 | 81 | 20,220 |
| 1920-21 | 19,110 | 20,990 | 13,440 | 3,013 | 1,251 | 1,883 | 476 | 58 | 19,665 |
| 1921-22 | 13,930 | 15,450 | 7,954 | 3,753 | 902 | 1,517 | 504 | 43 | 15,334 |
| 1922-23 | 16,980 | 19,300 | 9,755 | 4,247 | 1,391 | 2,318 | 553 | 55 | 17,959 |
| 1923-24 | 17,710 | 19,700 | 10,140 | 4,320 | 1,353 | 1,993 | 576 | 196 | 19,005 |
| 1924-25 | 22,620 | 24,800 | 13,628 | 5,065 | 1,507 | 2,179 | 805 | 453 | 23,825 |
| 1925-26 | 25,798 | 27,900 | 16,104 | 5,201 | 1,629 | 2,102 | 602 | 782 | 26,618 |
| 1926-27 | 26,558 | 28,300 | 17,977 | 4,205 | 1,586 | 1,742 | 484 | 774 | 27,813 |
| 1927-28 | 21,925 | 23,800 | 12,965 | 4,900 | 1,257 | 1,875 | 595 | 994 | 23,750 |
| 1928-29 | 24,056 | 25,900 | 14,478 | 4,718 | 1,628 | 1,844 | 507 | 1,232 | 25,771 |
| 1929-30 ⁶ | | | 14,919 | 4,452 | | | | 1,325 | |

Bureau of Agricultural Economics. International Institute of Agriculture and official sources unless otherwise stated. Data for crop year as given are for crops harvested between Aug. 1 and July 31 of the following year. For the United States prior to 1914 the figures apply to the year beginning Sept. 1.

¹ Chinese Cotton Mill Owners' Association. Figures represent the crop in the most important cotton-producing Provinces where the commercial crop is grown. Most of the cotton produced in other Provinces is used for home hand-loom consumption.

² Figures as reported by the United States Bureau of the Census, including the cotton destined to enter commercial channels for factory purposes. Estimates of the commercial crop in China are included.

³ Bales of 478 pounds net.

⁴ American in running bales and foreign cotton in bales of 478 pounds net.

⁵ Unofficial source.

⁶ Preliminary.

TABLE 132.—Cotton ginned to specified dates and total, by seasons, United States, 1909-1929

| Season beginning August | Cotton ginned to— | | | | | | | | | | Total ginned ¹ |
|-------------------------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------------|
| | Sept. 1 | Sept. 25 | Oct. 1 | Oct. 18 | Nov. 1 | Nov. 14 | Dec. 1 | Dec. 13 | Jan. 1 | Jan. 16 | |
| | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales | 1,000 bales |
| 1909 | 388 | 2,568 | 5,531 | 7,018 | 8,112 | 8,877 | 9,358 | 9,647 | 9,788 | 10,073 | |
| 1910 | 353 | 2,312 | 5,424 | 7,346 | 8,780 | 10,140 | 10,695 | 11,085 | 11,253 | 11,568 | |
| 1911 | 771 | 3,677 | 7,759 | 9,971 | 11,313 | 12,817 | 13,771 | 14,317 | 14,516 | 15,553 | |
| 1912 | 731 | 3,007 | 6,874 | 8,800 | 10,300 | 11,855 | 12,439 | 12,907 | 13,089 | 13,489 | |
| 1913 | 799 | 3,247 | 6,974 | 8,830 | 10,445 | 12,088 | 12,927 | 13,348 | 13,582 | 13,983 | |
| 1914 | 480 | 3,394 | 7,620 | 9,827 | 11,068 | 13,073 | 13,972 | 14,443 | 14,916 | 15,906 | |
| 1915 | 464 | 2,904 | 5,709 | 7,379 | 8,771 | 9,704 | 10,306 | 10,637 | 10,752 | 11,068 | |
| 1916 | 451 | 4,062 | 7,303 | 8,624 | 9,615 | 10,352 | 10,839 | 11,039 | 11,138 | 11,364 | |
| 1917 | 615 | 2,512 | 5,574 | 7,185 | 8,571 | 9,714 | 10,132 | 10,435 | 10,571 | 11,248 | |
| 1918 | 1,038 | 3,771 | 6,811 | 7,777 | 8,706 | 9,571 | 10,281 | 10,774 | 11,049 | 11,906 | |
| 1919 | 143 | 1,835 | 4,929 | 6,305 | 7,604 | 8,844 | 9,397 | 10,009 | 10,307 | 11,326 | |
| 1920 | 352 | 2,250 | 5,755 | 7,509 | 8,915 | 10,141 | 10,876 | 11,555 | 12,015 | 13,271 | |
| 1921 | 486 | 2,920 | 5,497 | 6,646 | 7,274 | 7,640 | 7,791 | 7,882 | 7,912 | 7,978 | |
| 1922 | 806 | 3,866 | 6,978 | 8,139 | 8,870 | 9,320 | 9,489 | 9,597 | 9,648 | 9,729 | |
| 1923 | 1,143 | 3,232 | 6,409 | 7,556 | 8,369 | 9,243 | 9,549 | 9,905 | 9,944 | 10,171 | |
| 1924 | 947 | 2,666 | 4,523 | 7,616 | 9,716 | 11,162 | 12,238 | 12,792 | 13,307 | 13,639 | |
| 1925 | 1,886 | 2,282 | 7,126 | 9,519 | 11,207 | 12,260 | 13,871 | 14,832 | 15,500 | 16,123 | |
| 1926 | 697 | 2,509 | 5,643 | 8,728 | 11,254 | 12,956 | 14,644 | 15,541 | 16,616 | 17,765 | |
| 1927 | 1,534 | 3,505 | 5,945 | 8,118 | 9,921 | 10,895 | 11,738 | 12,073 | 12,501 | 12,783 | |
| 1928 | 957 | 2,501 | 4,961 | 8,151 | 10,162 | 11,321 | 12,560 | 13,144 | 13,889 | 14,297 | |
| 1929 ² | 1,570 | 3,353 | 5,906 | 9,099 | 10,889 | 11,898 | 12,853 | 13,462 | 14,188 | | |

Bureau of Agricultural Economics. Compiled from reports of Bureau of the Census; quantities are given in running bales, except that round bales are counted as half bales. Linters not included.

¹ Includes cotton ginned after Jan. 16 and estimated quantities not ginned on Mar. 1.

² Sept. 16.

³ Preliminary.

TABLE 133.—*Cotton: Estimated monthly marketings by farmers, 1916-1928*

| Year beginning August | Percentage of year's sales ¹ | | | | | | | | | | | |
|--------------------------|---|-------|------|------|------|------|------|------|------|-----|------|------|
| | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July |
| 1916..... | 3.9 | 14.6 | 23.0 | 21.6 | 15.0 | 6.4 | 4.0 | 3.9 | 3.0 | 2.5 | 1.6 | 0.5 |
| 1917..... | 2.5 | 11.3 | 23.0 | 22.7 | 16.2 | 8.2 | 5.8 | 4.5 | 2.6 | 1.3 | 1.0 | 0.9 |
| 1918..... | 3.3 | 10.9 | 18.1 | 16.4 | 13.6 | 5.4 | 4.4 | 4.6 | 4.6 | 7.5 | 6.8 | 4.4 |
| 1919..... | 1.4 | 9.5 | 21.0 | 22.2 | 17.4 | 8.8 | 5.6 | 4.9 | 3.2 | 2.7 | 1.7 | 1.6 |
| 1920..... | 3.1 | 10.0 | 16.2 | 15.7 | 11.0 | 6.4 | 5.6 | 6.0 | 6.7 | 6.9 | 6.8 | 5.6 |
| 1921..... | 3.6 | 11.0 | 22.3 | 17.1 | 12.1 | 5.9 | 4.3 | 4.6 | 4.6 | 5.9 | 3.0 | 2.6 |
| 1922..... | 5.2 | 16.8 | 25.3 | 19.8 | 12.8 | 5.9 | 4.4 | 3.7 | 2.0 | 1.0 | 1.5 | 1.6 |
| 1923..... | 4.1 | 16.3 | 24.6 | 24.9 | 13.3 | 5.8 | 3.1 | 2.4 | 1.7 | 1.3 | 0.9 | 1.6 |
| 1924..... | 3.3 | 15.2 | 25.2 | 22.3 | 14.5 | 7.0 | 5.3 | 3.4 | 1.6 | 1.0 | 0.6 | 0.6 |
| 1925..... | 6.5 | 19.3 | 23.1 | 17.6 | 12.0 | 6.5 | 4.2 | 3.1 | 2.3 | 1.7 | 2.1 | 1.6 |
| 1926..... | 2.7 | 15.2 | 22.0 | 19.5 | 12.5 | 6.3 | 5.8 | 5.0 | 3.8 | 3.1 | 2.5 | 1.6 |
| 1927..... | 6.6 | 20.0 | 23.8 | 17.3 | 9.7 | 4.2 | 4.0 | 4.2 | 3.1 | 2.7 | 2.3 | 2.1 |
| 1928..... | 4.6 | 15.6 | 24.8 | 20.8 | 12.8 | 5.4 | 4.0 | 4.8 | 1.8 | 1.6 | 1.9 | 1.9 |

Bureau of Agricultural Economics.

¹As reported by about 7,500 cotton growers, supplemented by records of State weighers, cooperative associations, and cotton dealers.TABLE 134.—*Cotton: Consumption by domestic mills, 1919-20 to 1928-29, inclusive*

| Month | 1919-20 | 1920-21 | 1921-22 | 1922-23 | 1923-24 | 1924-25 | 1925-26 | 1926-27 | 1927-28 | 1928-29 |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> |
| August..... | 497 | 484 | 467 | 526 | 492 | 357 | 451 | 500 | 634 | 526 |
| September..... | 491 | 458 | 485 | 494 | 486 | 438 | 483 | 571 | 628 | 492 |
| October..... | 556 | 401 | 494 | 534 | 543 | 534 | 544 | 568 | 614 | 616 |
| November..... | 491 | 333 | 528 | 579 | 533 | 495 | 544 | 584 | 627 | 611 |
| December..... | 512 | 295 | 511 | 529 | 464 | 534 | 576 | 603 | 539 | 533 |
| January..... | 592 | 367 | 527 | 610 | 578 | 594 | 582 | 603 | 586 | 668 |
| February..... | 516 | 395 | 472 | 567 | 509 | 551 | 565 | 590 | 573 | 595 |
| March..... | 576 | 438 | 520 | 624 | 486 | 583 | 636 | 693 | 581 | 632 |
| April..... | 567 | 409 | 444 | 577 | 479 | 507 | 578 | 618 | 525 | 632 |
| May..... | 541 | 441 | 495 | 621 | 414 | 532 | 516 | 630 | 577 | 669 |
| June..... | 555 | 462 | 509 | 542 | 350 | 494 | 519 | 660 | 510 | 570 |
| July..... | 526 | 410 | 458 | 463 | 347 | 484 | 462 | 570 | 440 | 547 |
| Total..... | 6,420 | 4,893 | 5,910 | 6,666 | 5,681 | 6,103 | 6,456 | 7,190 | 6,834 | 7,091 |

Bureau of the Census. Quantities are in running bales, round bales counted as half bales and foreign in 500-pound bales. Linters not included.

TABLE 135.—*Cotton: Supply and distribution, United States, 1913 to 1928*

| Year beginning Aug. 1 | Supply | | | | | Distribution | | | | | |
|--------------------------|------------------------|---------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------------------|------------------------|---|
| | Produce tion | Carry-over from previous season | | Im- ports | Total supply | Consumption | | Ex- ports | Stocks on hand at end of year | | Total distribu- tion ¹ |
| | | For- eign | Total | | | For- eign | Total | | For- eign | Total | |
| | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> |
| 1913..... | 13,983 | 83 | 1,511 | 261 | 15,755 | 194 | 5,577 | 8,655 | 73 | 1,366 | 15,598 |
| 1914..... | 15,906 | 73 | 1,366 | 382 | 17,654 | 222 | 5,597 | 8,323 | 145 | 3,936 | 17,856 |
| 1915..... | 11,068 | 145 | 3,936 | 438 | 15,442 | 317 | 6,398 | 5,896 | 212 | 3,140 | 15,434 |
| 1916..... | 11,364 | 212 | 3,140 | 292 | 14,796 | 318 | 6,789 | 5,303 | 143 | 2,720 | 14,812 |
| 1917..... | 11,248 | 143 | 2,720 | 221 | 14,189 | 184 | 6,566 | 4,288 | 111 | 3,450 | 14,304 |
| 1918..... | 11,906 | 111 | 3,450 | 202 | 15,558 | 176 | 5,766 | 5,592 | 83 | 4,287 | 15,645 |
| 1919..... | 11,326 | 83 | 4,287 | 700 | 16,313 | 417 | 6,420 | 6,545 | 284 | 3,563 | 16,528 |
| 1920..... | 13,271 | 284 | 3,563 | 226 | 17,060 | 216 | 4,893 | 5,745 | 174 | 6,534 | 17,172 |
| 1921..... | 7,978 | 174 | 6,534 | 363 | 14,875 | 297 | 5,910 | 6,184 | 167 | 2,832 | 14,926 |
| 1922..... | 9,729 | 167 | 2,832 | 470 | 13,031 | 344 | 6,666 | 4,823 | 196 | 2,325 | 13,814 |
| 1923..... | 10,171 | 196 | 2,325 | 292 | 12,788 | 328 | 5,681 | 5,656 | 116 | 1,556 | 12,893 |
| 1924..... | 13,639 | 116 | 1,556 | 313 | 15,508 | 276 | 6,193 | 8,005 | 106 | 1,610 | 15,806 |
| 1925..... | 16,123 | 106 | 1,610 | 326 | 18,059 | 280 | 6,456 | 8,051 | 129 | 3,543 | 18,060 |
| 1926..... | 17,755 | 129 | 3,543 | 401 | 21,699 | 309 | 7,190 | 10,927 | 99 | 3,762 | 21,879 |
| 1927..... | 12,783 | 99 | 3,762 | 338 | 16,883 | 299 | 6,834 | 7,540 | 111 | 2,536 | 16,910 |
| 1928..... | 14,297 | 111 | 2,536 | 458 | 17,291 | 311 | 7,091 | 8,044 | 182 | 2,312 | 17,447 |

Bureau of Agricultural Economics. Compiled from Bureau of Census Reports. Linters are excluded. Quantities are in running bales, round bales counted as half bales and foreign in 500-pound bales.

¹Total distribution usually is greater than total supply due principally to the inclusion, in all distribution items, of the "city crop," which consists of rebaled samples and pickings from cotton damaged by fire and weather.

TABLE 136.—Cotton: International trade, average 1910-1914, annual 1926-1929

| Country | Year ended June 30 | | | | | | | | | |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | Average, 1910-1914 | | 1926 | | 1927 | | 1928 | | 1929 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | | | | | | | | | | |
| | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> | <i>1,000 bales</i> |
| United States..... | 232 | 8,840 | 338 | 8,110 | 400 | 11,281 | 367 | 7,890 | 476 | 8,520 |
| British India..... | 57 | 2,154 | 96 | 3,218 | 413 | 2,422 | 167 | 2,528 | 88 | 3,250 |
| Egypt..... | 0 | 1,444 | 0 | 1,409 | 0 | 1,595 | 0 | 1,377 | 0 | 1,645 |
| Argentina..... | 0 | 1 | 0 | 71 | 0 | 88 | 0 | 41 | | |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 4,143 | 0 | 3,345 | 0 | 3,728 | 0 | 2,460 | 0 | 3,164 | 0 |
| Japan..... | 1,405 | 0 | 3,233 | 0 | 3,485 | 0 | 2,617 | 0 | 3,112 | 0 |
| France..... | 1,440 | 337 | 1,565 | 88 | 1,692 | 133 | 1,623 | 122 | 1,668 | 108 |
| Germany..... | 2,142 | 221 | 1,587 | 205 | 1,812 | 280 | 2,563 | 392 | 1,757 | 353 |
| Italy..... | 902 | 0 | 1,023 | 2 | 1,037 | 1 | 982 | 1 | 1,121 | 0 |
| Czechoslovakia..... | 0 | 0 | 581 | 13 | 540 | 2 | 620 | 2 | 566 | 1 |
| Spain..... | 388 | 1 | 418 | 3 | 339 | 9 | | | | |
| Belgium..... | 2,663 | 2,278 | 407 | 2 | 362 | 6 | 370 | 18 | 404 | 21 |
| Canada..... | 155 | 0 | 274 | 0 | 296 | 0 | 261 | 0 | 306 | 0 |
| Poland..... | | 0 | 199 | 0 | 327 | 0 | 353 | 0 | 310 | 0 |
| Austria..... | 1,906 | 1,113 | 160 | 2 | 142 | 2 | 175 | 0 | | |
| Switzerland..... | 113 | 0 | 138 | 0 | 157 | 0 | 134 | 0 | 139 | 0 |
| Netherlands..... | 1,277 | 1,145 | 160 | 2 | 186 | 3 | 193 | 1 | 208 | 2 |
| Sweden..... | 93 | 1 | 97 | 0 | 114 | 0 | 111 | 0 | 101 | 0 |
| Finland..... | 37 | 0 | 40 | 0 | 41 | 0 | 46 | 0 | 38 | 0 |
| Denmark..... | 26 | 0 | 21 | 0 | 15 | 0 | 24 | 0 | 20 | 0 |
| Norway..... | 18 | 0 | 10 | 0 | 11 | 0 | 9 | 0 | 7 | 0 |
| Estonia..... | 0 | 0 | 21 | 0 | 24 | 0 | 26 | 0 | 24 | 0 |
| Hungary..... | | | 20 | 0 | 28 | 0 | 33 | 0 | 46 | 0 |
| Total, 23 countries..... | 12,997 | 13,434 | 13,733 | 13,125 | 15,149 | 15,822 | 13,149 | 12,372 | 12,434 | 13,900 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. Bales of 500 pounds gross weight or 478 pounds net. The figures for cotton refer to ginned and unginned cotton and linters, but not mill waste, cotton batting, scarto (Egyptian and Sudan). Wherever unginned cotton has been separately stated in the original reports it has been reduced to ginned cotton in this statement at the ratio of 3 pounds unginned to 1 pound ginned. Wherever linters are stated separately, they have been excluded from these figures.

¹ Year ended Dec. 31.

² 3-year average.

³ Average for Austria-Hungary.

⁴ International Crop Report and Agricultural Statistics.

TABLE 137.—Cotton: Estimated average price per pound, received by producers, United States, 1909-1929

| Year beginning August | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Weighted average |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909..... | 11.5 | 12.2 | 13.2 | 13.8 | 14.2 | 14.3 | 14.0 | 14.0 | 14.0 | 14.1 | 14.0 | 14.1 | 13.6 |
| 1910..... | 14.4 | 13.8 | 13.6 | 14.0 | 14.2 | 14.4 | 14.1 | 13.9 | 14.0 | 14.4 | 14.5 | 13.8 | 14.0 |
| 1911..... | 12.5 | 11.0 | 9.6 | 8.8 | 8.6 | 8.7 | 9.4 | 10.0 | 10.5 | 11.0 | 11.1 | 11.6 | 9.6 |
| 1912..... | 11.6 | 11.2 | 11.0 | 11.4 | 12.0 | 12.0 | 11.8 | 11.8 | 11.7 | 11.6 | 11.6 | 11.6 | 11.5 |
| 1913..... | 11.6 | 12.6 | 13.2 | 12.6 | 12.0 | 11.8 | 12.2 | 12.2 | 12.0 | 12.3 | 12.4 | 12.4 | 12.5 |
| 1914..... | 10.6 | 8.2 | 7.0 | 6.6 | 6.7 | 7.0 | 7.4 | 7.8 | 8.6 | 8.6 | 8.6 | 8.4 | 7.4 |
| 1915..... | 8.3 | 9.8 | 11.4 | 11.4 | 11.4 | 11.4 | 11.3 | 11.3 | 11.5 | 11.8 | 12.4 | 12.6 | 11.2 |
| 1916..... | 13.6 | 15.0 | 16.8 | 18.8 | 18.4 | 17.0 | 16.4 | 17.0 | 18.4 | 19.6 | 22.4 | 24.5 | 17.3 |
| 1917..... | 23.8 | 23.4 | 25.3 | 27.5 | 28.3 | 29.3 | 30.0 | 31.0 | 30.2 | 28.0 | 28.0 | 28.2 | 27.1 |
| 1918..... | 30.0 | 32.0 | 30.6 | 28.4 | 28.2 | 26.8 | 24.4 | 24.2 | 25.2 | 27.8 | 30.3 | 31.8 | 28.8 |
| 1919..... | 31.4 | 30.8 | 33.9 | 36.0 | 35.8 | 36.0 | 36.2 | 36.8 | 37.5 | 37.4 | 37.3 | 37.1 | 35.2 |
| 1920..... | 34.0 | 28.3 | 22.4 | 16.6 | 12.7 | 11.6 | 11.0 | 9.8 | 9.4 | 9.6 | 9.7 | 9.7 | 15.8 |
| 1921..... | 11.2 | 16.2 | 18.8 | 17.0 | 16.2 | 15.9 | 15.7 | 16.0 | 16.0 | 17.3 | 19.6 | 20.6 | 17.0 |
| 1922..... | 20.9 | 20.6 | 21.2 | 23.1 | 24.2 | 25.2 | 26.8 | 28.0 | 27.6 | 26.2 | 25.9 | 24.8 | 22.8 |
| 1923..... | 23.8 | 25.6 | 28.0 | 29.9 | 32.1 | 32.5 | 31.4 | 27.7 | 28.7 | 28.1 | 27.8 | 27.3 | 28.7 |
| 1924..... | 27.8 | 22.2 | 23.1 | 22.5 | 22.2 | 22.7 | 23.0 | 24.5 | 23.7 | 23.0 | 23.0 | 23.4 | 22.9 |
| 1925..... | 23.4 | 22.5 | 21.5 | 18.1 | 17.4 | 17.4 | 17.6 | 16.5 | 16.6 | 16.0 | 16.1 | 15.4 | 19.6 |
| 1926..... | 16.1 | 16.8 | 11.7 | 11.0 | 10.0 | 10.6 | 11.5 | 12.5 | 12.3 | 13.9 | 14.8 | 15.5 | 12.5 |
| 1927..... | 17.1 | 22.5 | 21.0 | 20.0 | 18.7 | 18.6 | 17.0 | 17.8 | 18.7 | 20.1 | 19.7 | 21.0 | 20.2 |
| 1928..... | 18.8 | 17.6 | 18.1 | 17.8 | 18.0 | 17.9 | 18.0 | 18.8 | 18.5 | 18.0 | 17.9 | 17.8 | 18.0 |
| 1929..... | 18.0 | 18.2 | 17.5 | 16.2 | 16.0 | | | | | | | | |

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices weighted by production of cotton for each State; yearly price obtained by weighting monthly prices by bales marketed monthly. Mean of prices reported on 1st of month and 1st of succeeding month, August, 1909-December, 1923.

TABLE 138.—Cotton, middling: Average spot price per pound at 10 markets in stated years

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Average |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Norfolk: | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1928..... | 19.03 | 18.17 | 18.80 | 19.11 | 19.46 | 19.26 | 19.23 | 20.11 | 19.37 | 18.73 | 18.67 | 18.86 | 19.07 |
| 1929..... | 18.74 | 18.71 | 18.15 | 17.31 | 17.09 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Augusta: | | | | | | | | | | | | | |
| 1928..... | 19.11 | 18.00 | 18.70 | 18.94 | 19.22 | 19.11 | 19.19 | 19.92 | 19.03 | 18.60 | 18.94 | 18.67 | 18.95 |
| 1929..... | 18.22 | 18.00 | 17.92 | 16.98 | 16.90 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Savannah: | | | | | | | | | | | | | |
| 1928..... | 18.88 | 17.89 | 18.65 | 19.00 | 19.45 | 19.25 | 19.14 | 20.09 | 19.27 | 18.43 | 18.49 | 18.51 | 18.92 |
| 1929..... | 18.10 | 18.24 | 17.92 | 16.98 | 17.08 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Montgomery: | | | | | | | | | | | | | |
| 1928..... | 18.97 | 17.39 | 18.14 | 18.33 | 18.62 | 18.49 | 18.54 | 19.45 | 18.59 | 17.88 | 18.39 | 18.24 | 18.42 |
| 1929..... | 17.65 | 17.61 | 17.24 | 16.34 | 16.26 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Memphis: | | | | | | | | | | | | | |
| 1928..... | 18.62 | 17.57 | 18.10 | 18.24 | 18.70 | 18.51 | 18.49 | 19.37 | 18.52 | 17.87 | 17.90 | 17.87 | 18.31 |
| 1929..... | 17.77 | 17.51 | 17.05 | 16.29 | 16.31 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Little Rock: | | | | | | | | | | | | | |
| 1928..... | 18.45 | 17.60 | 18.18 | 18.25 | 18.71 | 18.50 | 18.41 | 19.43 | 18.65 | 17.61 | 17.85 | 17.88 | 18.29 |
| 1929..... | 17.68 | 17.50 | 17.00 | 16.22 | 16.17 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Dallas: | | | | | | | | | | | | | |
| 1928..... | 18.02 | 17.13 | 17.99 | 18.32 | 18.67 | 18.42 | 18.41 | 19.40 | 18.55 | 17.67 | 17.89 | 17.77 | 18.19 |
| 1929..... | 17.50 | 17.46 | 16.99 | 16.08 | 15.88 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Houston: | | | | | | | | | | | | | |
| 1928..... | 18.54 | 17.69 | 18.50 | 18.90 | 19.24 | 19.00 | 18.99 | 19.95 | 19.11 | 18.40 | 18.33 | 18.20 | 18.74 |
| 1929..... | 18.04 | 18.30 | 17.86 | 17.00 | 16.77 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Galveston: | | | | | | | | | | | | | |
| 1928..... | 18.60 | 17.85 | 18.71 | 19.04 | 19.31 | 19.09 | 19.15 | 20.07 | 19.15 | 18.41 | 18.37 | 18.15 | 18.82 |
| 1929..... | 18.08 | 18.27 | 17.98 | 17.09 | 16.88 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| New Orleans: | | | | | | | | | | | | | |
| 1909..... | 12.28 | 12.66 | 13.48 | 14.40 | 14.96 | 15.23 | 14.88 | 14.74 | 14.64 | 14.89 | 14.85 | 14.93 | 14.33 |
| 1910..... | 14.92 | 13.49 | 14.21 | 14.50 | 14.85 | 14.95 | 14.62 | 14.54 | 14.70 | 15.48 | 15.26 | 14.30 | 14.65 |
| 1911..... | 11.96 | 11.29 | 9.61 | 9.35 | 9.17 | 9.53 | 10.31 | 10.65 | 11.61 | 11.72 | 12.07 | 12.93 | 10.85 |
| 1912..... | 12.07 | 11.37 | 10.95 | 12.15 | 12.81 | 12.58 | 12.61 | 12.45 | 12.44 | 12.29 | 12.44 | 12.34 | 12.20 |
| 1913..... | 12.02 | 13.11 | 13.73 | 13.26 | 12.98 | 12.93 | 12.90 | 12.95 | 13.11 | 13.36 | 13.79 | 13.34 | 13.12 |
| 1914..... | (1) | 8.42 | 7.02 | 7.43 | 7.18 | 7.87 | 8.01 | 8.34 | 9.43 | 9.04 | 9.12 | 8.71 | ..... |
| 1915..... | 8.94 | 10.40 | 11.95 | 11.50 | 11.89 | 12.04 | 11.45 | 11.73 | 11.88 | 12.61 | 12.80 | 13.03 | 11.68 |
| 1916..... | 14.26 | 15.27 | 17.24 | 19.45 | 18.34 | 17.33 | 17.11 | 17.94 | 19.51 | 20.06 | 24.18 | 25.41 | 18.84 |
| 1917..... | 25.07 | 21.68 | 26.76 | 28.07 | 29.07 | 31.07 | 30.91 | 32.76 | 33.05 | 28.90 | 30.71 | 29.50 | 28.96 |
| 1918..... | 30.23 | 33.22 | 31.18 | 29.75 | 29.44 | 28.84 | 26.97 | 26.84 | 26.70 | 29.22 | 32.09 | 33.93 | 29.87 |
| 1919..... | 31.38 | 30.38 | 35.28 | 39.58 | 39.89 | 40.28 | 39.39 | 40.69 | 41.41 | 40.31 | 40.49 | 30.41 | 38.21 |
| 1920..... | 34.03 | 27.48 | 29.05 | 17.05 | 14.59 | 14.53 | 12.85 | 11.08 | 11.17 | 11.80 | 11.03 | 11.49 | 16.55 |
| 1921..... | 12.78 | 19.35 | 18.99 | 17.27 | 17.16 | 16.53 | 16.36 | 16.74 | 16.80 | 19.31 | 21.68 | 22.01 | 17.92 |
| 1922..... | 21.55 | 20.74 | 22.05 | 25.34 | 25.48 | 27.51 | 28.78 | 30.43 | 28.42 | 26.63 | 28.61 | 25.73 | 25.94 |
| 1923..... | 24.22 | 27.71 | 29.18 | 33.68 | 34.88 | 33.93 | 31.90 | 28.74 | 30.11 | 30.70 | 29.43 | 29.23 | 30.33 |
| 1924..... | 26.65 | 22.79 | 23.48 | 23.95 | 23.66 | 23.66 | 24.61 | 25.52 | 21.52 | 23.54 | 24.07 | 24.05 | 24.21 |
| 1925..... | 23.07 | 23.09 | 20.86 | 19.82 | 19.27 | 20.26 | 19.83 | 18.35 | 18.11 | 18.06 | 17.54 | 18.24 | 19.71 |
| 1926..... | 18.01 | 16.14 | 12.68 | 12.52 | 12.22 | 13.17 | 13.82 | 14.10 | 14.42 | 15.68 | 16.47 | 17.63 | 14.74 |
| 1927..... | 19.36 | 21.53 | 20.73 | 19.99 | 19.26 | 18.72 | 17.90 | 18.94 | 20.07 | 20.77 | 21.10 | 21.45 | 19.98 |
| 1928..... | 19.00 | 17.94 | 18.79 | 19.00 | 19.36 | 19.14 | 19.07 | 19.97 | 19.23 | 18.74 | 18.81 | 18.73 | 18.98 |
| 1929..... | 18.57 | 18.45 | 18.08 | 17.19 | 17.04 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 10 markets combined: | | | | | | | | | | | | | |
| 1915..... | 8.80 | 10.29 | 11.99 | 11.49 | 11.97 | 12.10 | 11.64 | 11.78 | 11.94 | 12.67 | 12.89 | 13.11 | 11.72 |
| 1916..... | 14.32 | 15.31 | 17.38 | 19.54 | 18.44 | 17.70 | 16.54 | 18.29 | 19.72 | 20.15 | 24.33 | 25.45 | 18.96 |
| 1917..... | 25.26 | 22.08 | 26.96 | 28.21 | 29.19 | 31.05 | 30.97 | 32.94 | 32.87 | 29.32 | 30.10 | 29.44 | 29.02 |
| 1918..... | 31.05 | 33.38 | 31.11 | 29.27 | 29.22 | 28.51 | 26.55 | 26.40 | 26.84 | 29.21 | 31.84 | 33.80 | 29.76 |
| 1919..... | 31.50 | 30.30 | 35.44 | 39.59 | 39.70 | 40.46 | 39.49 | 40.68 | 41.74 | 41.01 | 40.58 | 39.58 | 38.34 |
| 1920..... | 34.78 | 28.24 | 21.38 | 17.83 | 14.63 | 14.42 | 12.93 | 11.19 | 11.01 | 11.55 | 10.77 | 11.13 | 16.66 |
| 1921..... | 12.53 | 19.50 | 19.25 | 17.43 | 17.47 | 17.04 | 16.73 | 17.12 | 16.92 | 19.22 | 21.58 | 22.27 | 18.09 |
| 1922..... | 21.53 | 20.72 | 22.11 | 25.20 | 25.40 | 27.39 | 28.62 | 30.21 | 28.28 | 26.47 | 28.20 | 25.87 | 25.83 |
| 1923..... | 24.22 | 27.67 | 28.90 | 33.30 | 34.39 | 33.69 | 31.73 | 28.54 | 30.25 | 30.32 | 29.37 | 29.32 | 30.14 |
| 1924..... | 27.16 | 22.74 | 23.29 | 23.63 | 23.40 | 23.53 | 24.51 | 25.51 | 24.56 | 23.61 | 24.19 | 24.55 | 24.22 |
| 1925..... | 23.35 | 23.23 | 20.95 | 19.92 | 19.31 | 20.04 | 19.63 | 18.33 | 18.05 | 17.95 | 17.52 | 17.92 | 19.68 |
| 1926..... | 17.65 | 15.96 | 12.40 | 12.17 | 11.81 | 12.72 | 13.45 | 13.74 | 14.08 | 15.38 | 16.10 | 17.34 | 14.40 |
| 1927..... | 19.16 | 21.19 | 20.35 | 19.74 | 18.99 | 18.44 | 17.60 | 18.76 | 19.76 | 20.54 | 20.82 | 21.25 | 19.72 |
| 1928..... | 18.72 | 17.72 | 18.46 | 18.70 | 19.07 | 18.88 | 18.86 | 19.78 | 18.95 | 18.23 | 18.36 | 18.29 | 18.67 |
| 1929..... | 18.04 | 18.01 | 17.62 | 16.75 | 16.64 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

Bureau of Agricultural Economics. Prior to Aug. 16, 1915, compiled from quotations in Market Reports of the New York Cotton Exchange, except Sept. 23 to Nov. 16, 1914, when the exchange was closed, quotations for which time were taken from the New York Commercial and Financial Chronicle, from Aug. 16, 1915, compiled from daily reports to the bureau from the cotton exchanges of the various markets. Prices 1900-1908 for New Orleans and 1914-1926 for other markets are available in 1924 Yearbook, p. 756, Table 313, p. 757, Table 314, and 1927 Yearbook, Table 254, p. 920.

¹ Market closed.

² No quotations prior to Sept. 23. Average for 7 days' business.

³ Does not include New Orleans.

⁴ Does not include Savannah.

TABLE 139.—*Cotton: Average monthly premiums¹ for staple lengths for middling spot cotton at New Orleans, 1923-24 to 1928-29*

[Points]

| Year and staple length | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Av. |
|--|-------|-------|------|------|------|------|-------|-------|-------|-------|-------|-------|-----|
| 1923-24 | | | | | | | | | | | | | |
| 1 ³ / ₁₆ inch..... | 40 | 40 | 40 | 45 | 60 | 60 | 60 | 60 | 60 | 60 | 65 | 65 | 55 |
| 1 inch..... | 60 | 60 | 60 | 60 | 60 | 75 | 80 | 80 | 80 | 85 | 90 | 95 | 74 |
| 1 ¹ / ₁₆ inches..... | 50 | 50 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 92 |
| 1 ¹ / ₈ inches..... | 100 | 100 | 175 | 175 | 175 | 205 | 175 | 175 | 175 | 175 | 175 | 175 | 163 |
| 1 ¹ / ₄ inches..... | 150 | 150 | 275 | 275 | 275 | 325 | 275 | 275 | 275 | 275 | 275 | 275 | 258 |
| 1 ³ / ₄ inches..... | 225 | 225 | 500 | 420 | 400 | 420 | 400 | 400 | 400 | 400 | 400 | 400 | 380 |
| 1924-25 | | | | | | | | | | | | | |
| 1 ³ / ₁₆ inch..... | 60 | 60 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 70 | 75 | 75 | 66 |
| 1 inch..... | 112 | 112 | 112 | 125 | 125 | 110 | 120 | 100 | 90 | 110 | 120 | 110 | 112 |
| 1 ¹ / ₁₆ inches..... | 100 | 106 | 125 | 125 | 125 | 160 | 175 | 175 | 250 | 250 | 250 | 250 | 174 |
| 1 ¹ / ₈ inches..... | 175 | 175 | 175 | 225 | 250 | 360 | 400 | 400 | 550 | 530 | 550 | 550 | 362 |
| 1 ¹ / ₄ inches..... | 275 | 281 | 300 | 375 | 400 | 530 | 650 | 650 | 800 | 800 | 800 | 800 | 555 |
| 1 ³ / ₄ inches..... | 400 | 412 | 450 | 525 | 550 | 820 | 1,000 | 1,000 | 1,150 | 1,150 | 1,150 | 1,150 | 813 |
| 1925-26 | | | | | | | | | | | | | |
| 1 ³ / ₁₆ inch..... | 75 | 75 | 75 | 75 | 85 | 100 | 90 | 80 | 80 | 75 | 75 | 75 | 80 |
| 1 inch..... | 100 | 100 | 100 | 105 | 115 | 125 | 120 | 110 | 100 | 100 | 100 | 100 | 106 |
| 1 ¹ / ₁₆ inches..... | 250 | 194 | 175 | 231 | 250 | 250 | 250 | 200 | 200 | 200 | 200 | 200 | 217 |
| 1 ¹ / ₈ inches..... | 550 | 287 | 300 | 375 | 400 | 400 | 400 | 350 | 350 | 350 | 350 | 350 | 372 |
| 1 ¹ / ₄ inches..... | 800 | 625 | 575 | 537 | 600 | 600 | 600 | 550 | 550 | 550 | 550 | 550 | 591 |
| 1 ³ / ₄ inches..... | 1,150 | 887 | 800 | 850 | 900 | 900 | 900 | 900 | 900 | 900 | 900 | 900 | 907 |
| 1926-27 | | | | | | | | | | | | | |
| 1 ³ / ₁₆ inch..... | 40 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 58 |
| 1 inch..... | 75 | 110 | 110 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1 ¹ / ₁₆ inches..... | 200 | 200 | 105 | 138 | 150 | 150 | 150 | 150 | 150 | 200 | 200 | 200 | 166 |
| 1 ¹ / ₈ inches..... | 350 | 350 | 235 | 238 | 250 | 250 | 250 | 250 | 250 | 300 | 300 | 300 | 277 |
| 1 ¹ / ₄ inches..... | 550 | 550 | 410 | 450 | 450 | 450 | 450 | 450 | 450 | 500 | 513 | 590 | 484 |
| 1 ³ / ₄ inches..... | 900 | 900 | 670 | 800 | 840 | 875 | 900 | 900 | 900 | 900 | 900 | 900 | 730 |
| 1927-28 | | | | | | | | | | | | | |
| 1 ³ / ₁₆ inch..... | 40 | 40 | 40 | 40 | 50 | 40 | 35 | 35 | 25 | 20 | 20 | 20 | 34 |
| 1 inch..... | 75 | 75 | 75 | 75 | 100 | 100 | 100 | 100 | 75 | 60 | 60 | 60 | 80 |
| 1 ¹ / ₁₆ inches..... | 163 | 169 | 250 | 238 | 200 | 200 | 200 | 200 | 175 | 175 | 170 | 150 | 191 |
| 1 ¹ / ₈ inches..... | 244 | 263 | 350 | 338 | 300 | 300 | 300 | 300 | 250 | 250 | 245 | 225 | 280 |
| 1 ¹ / ₄ inches..... | 525 | 513 | 550 | 513 | 400 | 400 | 400 | 400 | 350 | 350 | 340 | 300 | 420 |
| 1 ³ / ₄ inches..... | 788 | 788 | 850 | 800 | 650 | 650 | 650 | 650 | 550 | 550 | 535 | 475 | 661 |
| 1928-29 | | | | | | | | | | | | | |
| 1 ³ / ₁₆ inch..... | 20 | 20 | 30 | 20 | 20 | 15 | 19 | 25 | 25 | 37 | 40 | 40 | 27 |
| 1 inch..... | 60 | 60 | 84 | 95 | 85 | 75 | 75 | 75 | 92 | 104 | 118 | 125 | 87 |
| 1 ¹ / ₁₆ inches..... | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 165 | 200 | 225 | 162 |
| 1 ¹ / ₈ inches..... | 225 | 206 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 230 | 275 | 300 | 220 |
| 1 ¹ / ₄ inches..... | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 345 | 400 | 425 | 323 |
| 1 ³ / ₄ inches..... | 475 | 494 | 488 | 450 | 450 | 450 | 450 | 450 | 450 | 540 | 675 | 750 | 510 |

Bureau of Agricultural Economics. Based on weekly quotations for middling 7/8-inch staple. See Table 268, p. 852, 1928 Yearbook for data for earlier years.

¹ Premiums are stated in points or hundredths of a cent per pound.

TABLE 140.—Cotton: Average monthly premiums and discounts for grades above and below middling for the 10 designated spot markets, 1925-26 to 1928-29

| Year and month | Grade ¹ | | | | | | | | |
|----------------|------------------------|---------------------------------|-----------------------|-------------------------|---|--------------------------------|----------------------|--|-----------------------|
| | Mid- dling fair | Strict good mid- dling | Good mid- dling | Strict mid- dling | Mid- dling (aver- age price) ² | Strict low mid- dling | Low mid- dling | Strict good ordi- nary ³ | Good ordi- nary |
| August: | <i>On</i> ⁴ | <i>On</i> | <i>On</i> | <i>On</i> | | <i>Off</i> ⁴ | <i>Off</i> | <i>Off</i> | <i>Off</i> |
| 1925-26 | 100 | 76 | 54 | 32 | 23.35 | 56 | 127 | 231 | 338 |
| 1926-27 | 104 | 84 | 62 | 44 | 17.65 | 128 | 335 | 546 | 691 |
| 1927-28 | 130 | 106 | 76 | 51 | 19.16 | 103 | 213 | 333 | 448 |
| 1928-29 | 84 | 60 | 30 | 26 | 18.72 | 44 | 98 | 164 | 234 |
| September: | | | | | | | | | |
| 1925-26 | 96 | 72 | 48 | 28 | 23.23 | 60 | 140 | 244 | 353 |
| 1926-27 | 109 | 87 | 64 | 45 | 15.06 | 121 | 317 | 517 | 658 |
| 1927-28 | 125 | 102 | 73 | 49 | 21.19 | 100 | 211 | 333 | 447 |
| 1928-29 | 53 | 59 | 39 | 25 | 17.72 | 67 | 138 | 209 | 285 |
| October: | | | | | | | | | |
| 1925-26 | 115 | 89 | 65 | 41 | 20.95 | 83 | 181 | 290 | 400 |
| 1926-27 | 111 | 88 | 65 | 43 | 12.40 | 102 | 260 | 419 | 546 |
| 1927-28 | 124 | 101 | 68 | 48 | 20.35 | 82 | 187 | 307 | 417 |
| 1928-29 | 83 | 62 | 41 | 26 | 18.46 | 79 | 159 | 237 | 321 |
| November: | | | | | | | | | |
| 1925-26 | 138 | 110 | 84 | 58 | 19.02 | 111 | 240 | 376 | 496 |
| 1926-27 | 125 | 102 | 78 | 53 | 12.17 | 99 | 232 | 344 | 483 |
| 1927-28 | 105 | 83 | 60 | 41 | 19.74 | 48 | 124 | 221 | 314 |
| 1928-29 | 81 | 61 | 41 | 26 | 18.70 | 81 | 161 | 242 | 327 |
| December: | | | | | | | | | |
| 1925-26 | 146 | 118 | 92 | 64 | 19.31 | 114 | 271 | 428 | 556 |
| 1926-27 | 134 | 110 | 86 | 61 | 11.81 | 99 | 228 | 358 | 472 |
| 1927-28 | 94 | 69 | 45 | 30 | 18.99 | 36 | 85 | 162 | 241 |
| 1928-29 | 78 | 58 | 39 | 25 | 19.07 | 79 | 157 | 238 | 322 |
| January: | | | | | | | | | |
| 1925-26 | 153 | 124 | 96 | 67 | 20.04 | 117 | 295 | 466 | 602 |
| 1926-27 | 136 | 112 | 88 | 62 | 12.72 | 101 | 230 | 360 | 475 |
| 1927-28 | 93 | 68 | 44 | 29 | 18.44 | 35 | 80 | 150 | 227 |
| 1928-29 | 77 | 57 | 39 | 25 | 18.87 | 78 | 162 | 247 | 336 |
| February: | | | | | | | | | |
| 1925-26 | 154 | 125 | 94 | 66 | 19.63 | 130 | 306 | 481 | 613 |
| 1926-27 | 139 | 115 | 91 | 65 | 13.45 | 102 | 225 | 350 | 464 |
| 1927-28 | 91 | 65 | 40 | 25 | 17.60 | 34 | 74 | 146 | 220 |
| 1928-29 | 78 | 58 | 39 | 26 | 18.86 | 78 | 162 | 250 | 340 |
| March: | | | | | | | | | |
| 1925-26 | 147 | 119 | 87 | 62 | 18.33 | 131 | 313 | 499 | 640 |
| 1926-27 | 139 | 115 | 91 | 65 | 13.74 | 96 | 204 | 330 | 444 |
| 1927-28 | 91 | 65 | 40 | 25 | 18.76 | 33 | 73 | 138 | 213 |
| 1928-29 | 79 | 59 | 41 | 28 | 19.77 | 77 | 161 | 250 | 340 |
| April: | | | | | | | | | |
| 1925-26 | 120 | 96 | 72 | 50 | 18.05 | 130 | 327 | 524 | 670 |
| 1926-27 | 139 | 115 | 91 | 65 | 14.08 | 99 | 204 | 329 | 442 |
| 1927-28 | 90 | 64 | 39 | 25 | 19.77 | 33 | 73 | 138 | 213 |
| 1928-29 | 80 | 60 | 42 | 29 | 18.94 | 76 | 161 | 250 | 340 |
| May: | | | | | | | | | |
| 1925-26 | 107 | 86 | 64 | 43 | 17.95 | 130 | 336 | 547 | 699 |
| 1926-27 | 139 | 115 | 91 | 65 | 15.38 | 98 | 206 | 331 | 444 |
| 1927-28 | 89 | 64 | 40 | 25 | 20.53 | 33 | 77 | 143 | 218 |
| 1928-29 | 80 | 61 | 43 | 30 | 18.24 | 75 | 160 | 250 | 340 |
| June: | | | | | | | | | |
| 1925-26 | 105 | 83 | 62 | 44 | 17.52 | 128 | 336 | 548 | 699 |
| 1926-27 | 139 | 115 | 89 | 63 | 16.10 | 98 | 208 | 333 | 445 |
| 1927-28 | 87 | 63 | 40 | 26 | 20.82 | 34 | 80 | 147 | 222 |
| 1928-29 | 83 | 64 | 49 | 35 | 18.36 | 74 | 160 | 250 | 340 |
| July: | | | | | | | | | |
| 1925-26 | 105 | 84 | 62 | 43 | 17.92 | 128 | 338 | 548 | 693 |
| 1926-27 | 139 | 115 | 86 | 60 | 17.34 | 100 | 210 | 333 | 446 |
| 1927-28 | 85 | 61 | 39 | 26 | 21.25 | 37 | 86 | 153 | 227 |
| 1928-29 | 84 | 65 | 51 | 38 | 18.29 | 73 | 160 | 250 | 340 |
| Average: | | | | | | | | | |
| 1925-26 | 124 | 98 | 73 | 50 | 19.08 | 110 | 268 | 432 | 563 |
| 1926-27 | 129 | 106 | 82 | 58 | 14.40 | 104 | 238 | 379 | 501 |
| 1927-28 | 100 | 76 | 50 | 33 | 19.72 | 51 | 114 | 198 | 284 |
| 1928-29 | 81 | 60 | 42 | 28 | 18.67 | 73 | 153 | 236 | 322 |

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¹ White Standards.² Based on $\frac{3}{16}$ -inch staple.³ These grades are not deliverable on future contracts.⁴ The differences are stated in terms of points or hundredths of a cent per pound. By "On" is meant that the stated number of points is to be added to the price of middling and by "Off" is meant that the stated number of points is to be subtracted from the price of middling.

TABLE 141.—*Cotton: Average spot price per pound in specified foreign markets, 1912-1929*LIVERPOOL, AMERICAN MIDDLING ¹

| Year | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Average |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1912 | 13.83 | 13.55 | 12.59 | 13.82 | 14.31 | 14.06 | 13.97 | 13.97 | 14.00 | 13.58 | 13.67 | 13.61 | 13.75 |
| 1913 | 13.38 | 15.10 | 15.55 | 14.94 | 14.54 | 14.34 | 14.25 | 14.28 | 15.02 | 15.20 | 15.71 | 14.74 | 14.75 |
| 1914 | 13.23 | 12.22 | 10.53 | 9.25 | 8.93 | 9.77 | 10.06 | 10.46 | 11.37 | 10.42 | 10.47 | 10.32 | 10.50 |
| 1915 | 10.79 | 12.24 | 13.90 | 13.74 | 15.03 | 15.99 | 15.61 | 15.48 | 15.47 | 16.77 | 16.47 | 15.94 | 14.79 |
| 1916 | 17.54 | 18.90 | 20.69 | 23.05 | 22.16 | 21.76 | 21.34 | 24.07 | 25.25 | 26.17 | 34.07 | 37.65 | 24.39 |
| 1917 | 38.21 | 35.96 | 34.85 | 43.38 | 41.25 | 46.16 | 45.88 | 47.19 | 46.52 | 42.28 | 43.89 | 43.09 | 42.64 |
| 1918 | 45.26 | 48.44 | 46.46 | 43.97 | 42.30 | 37.66 | 34.53 | 30.39 | 33.24 | 35.70 | 38.25 | 38.33 | 39.54 |
| 1919 | 34.06 | 32.20 | 38.06 | 41.90 | 40.92 | 43.61 | 41.61 | 45.16 | 44.17 | 42.51 | 44.48 | 41.83 | 40.88 |
| 1920 | 38.31 | 31.33 | 24.41 | 19.18 | 14.74 | 15.32 | 11.71 | 11.78 | 12.07 | 12.53 | 11.66 | 11.94 | 18.00 |
| 1921 | 13.34 | 20.70 | 20.85 | 18.46 | 18.84 | 18.12 | 17.75 | 19.21 | 18.89 | 21.42 | 23.46 | 24.98 | 19.67 |
| 1922 | 24.90 | 23.98 | 24.55 | 27.96 | 28.26 | 30.64 | 30.93 | 31.42 | 30.29 | 28.43 | 31.53 | 29.28 | 28.51 |
| 1923 | 28.18 | 31.99 | 31.96 | 35.74 | 36.00 | 34.33 | 32.53 | 29.77 | 33.15 | 32.00 | 30.74 | 30.38 | 31.90 |
| 1924 | 31.62 | 25.06 | 26.13 | 26.09 | 25.73 | 25.90 | 27.17 | 27.95 | 26.85 | 25.83 | 27.31 | 27.76 | 26.12 |
| 1925 | 26.28 | 26.25 | 23.17 | 21.51 | 20.51 | 21.68 | 21.00 | 20.32 | 20.31 | 20.73 | 19.98 | 19.76 | 21.82 |
| 1926 | 19.69 | 19.55 | 14.51 | 14.08 | 13.34 | 14.55 | 15.56 | 15.65 | 16.24 | 17.90 | 18.55 | 19.42 | 16.57 |
| 1927 | 21.10 | 24.17 | 23.36 | 22.73 | 21.98 | 21.68 | 20.53 | 21.80 | 22.75 | 23.52 | 23.82 | 24.44 | 22.66 |
| 1928 | 21.39 | 20.87 | 21.85 | 21.62 | 21.57 | 21.39 | 21.09 | 22.33 | 21.56 | 20.06 | 20.88 | 21.09 | 21.36 |
| 1929 | 21.01 | 21.0 | 20.5 | 19.6 | 19.2 | | | | | | | | |

LIVERPOOL, EGYPTIAN UPPERS, GOOD ¹

| Year | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Average |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1912 | 20.2 | 19.1 | 18.3 | 18.9 | 19.3 | 19.9 | 20.1 | 20.2 | 20.3 | 20.2 | 19.7 | 19.0 | 19.6 |
| 1913 | 18.8 | 20.0 | 20.2 | 20.0 | 19.5 | 18.9 | 17.9 | 17.3 | 17.9 | 18.1 | 18.2 | 17.6 | 18.7 |
| 1914 | 16.5 | 16.1 | 13.5 | 12.6 | 12.2 | 12.2 | 12.8 | 14.0 | 15.5 | 14.5 | 14.4 | 13.8 | 14.0 |
| 1915 | 14.1 | 15.4 | 18.1 | 17.9 | 18.6 | 21.9 | 22.5 | 22.4 | 21.6 | 22.4 | 23.5 | 23.7 | 20.2 |
| 1916 | 23.7 | 27.2 | 31.2 | 39.5 | 39.6 | 39.7 | 41.9 | 44.5 | 50.5 | 52.0 | 55.4 | 60.3 | 42.1 |
| 1917 | 60.9 | 52.0 | 46.7 | 51.6 | 54.4 | 53.8 | 51.5 | 54.9 | 56.3 | 54.0 | 52.6 | 54.4 | 53.6 |
| 1918 | 55.8 | 55.4 | 54.3 | 51.7 | 50.4 | 50.3 | 50.0 | 49.3 | 48.3 | 48.3 | 58.4 | 46.4 | 50.7 |
| 1919 | 48.8 | 48.8 | 53.4 | 67.0 | 76.3 | 94.0 | 105.0 | 108.7 | 107.6 | 97.1 | 81.3 | 71.6 | 80.0 |
| 1920 | 68.6 | 53.4 | 37.0 | 29.4 | 23.4 | 24.6 | 20.8 | 19.6 | 21.5 | 18.8 | 18.8 | 18.0 | 20.5 |
| 1921 | 18.6 | 29.3 | 33.3 | 28.3 | 29.4 | 28.8 | 27.4 | 28.4 | 26.8 | 28.1 | 29.7 | 29.4 | 28.1 |
| 1922 | 28.1 | 27.4 | 27.3 | 30.7 | 31.2 | 31.9 | 32.5 | 33.9 | 33.0 | 30.4 | 31.9 | 31.0 | 30.8 |
| 1923 | 31.5 | 33.4 | 33.5 | 39.6 | 41.5 | 39.7 | 39.0 | 37.5 | 41.2 | 43.9 | 43.3 | 43.6 | 39.0 |
| 1924 | 45.6 | 35.5 | 34.3 | 35.4 | 37.5 | 40.3 | 41.3 | 45.1 | 43.6 | 42.1 | 41.6 | 41.4 | 40.0 |
| 1925 | 39.5 | 37.1 | 35.0 | 32.6 | 30.8 | 29.9 | 28.5 | 26.2 | 25.9 | 27.3 | 26.2 | 25.2 | 30.3 |
| 1926 | 26.0 | 28.0 | 23.8 | 22.2 | 19.4 | 21.8 | 24.3 | 23.5 | 23.3 | 26.7 | 28.3 | 30.2 | 24.4 |
| 1927 | 32.0 | 32.0 | 31.8 | 31.3 | 29.9 | 28.3 | 27.6 | 30.0 | 32.7 | 33.3 | 31.3 | 30.4 | 31.8 |
| 1928 | 27.1 | 25.1 | 25.9 | 25.6 | 25.5 | 25.5 | 25.0 | 26.7 | 25.7 | 24.0 | 23.5 | 23.7 | 25.3 |
| 1929 | 23.6 | 24.2 | 23.0 | 22.3 | 22.0 | | | | | | | | |

LIVERPOOL, NO. 1 OOMRAS, FULLY GOOD ¹

| | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1912 | 12.2 | 11.9 | 11.6 | 12.1 | 12.5 | 12.7 | 12.8 | 12.7 | 12.5 | 12.2 | 11.9 | 11.8 | 12.2 |
| 1913 | 11.6 | 12.9 | 12.9 | 12.8 | 12.5 | 12.0 | 11.5 | 11.5 | 11.5 | 11.4 | 11.0 | 10.6 | 11.8 |
| 1914 | 9.7 | 9.1 | 8.8 | 7.9 | 7.7 | 8.5 | 8.4 | 8.5 | 9.2 | 8.9 | 9.1 | 8.9 | 8.7 |
| 1915 | 9.1 | 9.7 | 10.9 | 10.7 | 11.9 | 12.6 | 12.4 | 12.1 | 11.9 | 13.0 | 12.8 | 12.9 | 10.7 |
| 1916 | 14.2 | 15.0 | 15.8 | 17.6 | 16.6 | 16.9 | 17.3 | 20.2 | 21.0 | 22.1 | 31.2 | 33.4 | 20.1 |
| 1917 | 34.2 | 31.9 | 36.9 | 37.6 | 37.2 | 38.2 | 37.6 | 38.2 | 38.2 | 35.2 | 36.8 | 36.8 | 36.6 |
| 1918 | 37.8 | 44.1 | 42.4 | 37.5 | 34.3 | 35.3 | 32.6 | 27.7 | 28.9 | 30.1 | 32.4 | 32.2 | 34.6 |
| 1919 | 30.7 | 29.0 | 30.5 | 32.1 | 32.0 | 32.6 | 30.0 | 32.3 | 31.8 | 30.2 | 29.1 | 28.1 | 30.5 |
| 1920 | 23.8 | 21.6 | 18.5 | 15.7 | 12.0 | 11.9 | 10.6 | 9.2 | 9.4 | 9.8 | 9.2 | 9.3 | 13.4 |
| 1921 | 10.5 | 16.0 | 16.9 | 15.3 | 15.4 | 15.3 | 14.9 | 15.4 | 16.0 | 15.7 | 18.9 | 19.7 | 15.8 |
| 1922 | 19.8 | 18.9 | 18.8 | 20.6 | 20.5 | 21.9 | 22.2 | 21.7 | 20.7 | 19.4 | 20.8 | 20.2 | 20.5 |
| 1923 | 19.6 | 18.8 | 22.0 | 25.9 | 27.7 | 26.1 | 25.2 | 22.4 | 24.0 | 22.9 | 22.6 | 22.0 | 23.5 |
| 1924 | 23.4 | 19.7 | 22.3 | 23.3 | 23.5 | 22.6 | 23.5 | 23.2 | 22.2 | 21.2 | 21.6 | 22.0 | 22.4 |
| 1925 | 21.5 | 22.0 | 19.9 | 18.1 | 16.8 | 17.4 | 16.8 | 15.4 | 15.1 | 15.6 | 15.0 | 15.2 | 17.4 |
| 1926 | 15.5 | 15.4 | 12.5 | 12.1 | 11.5 | 12.5 | 13.3 | 13.4 | 13.9 | 15.4 | 16.2 | 17.0 | 14.1 |
| 1927 | 17.8 | 20.1 | 19.3 | 17.7 | 17.6 | 17.4 | 16.5 | 17.5 | 17.9 | 18.3 | 18.6 | 18.5 | 18.1 |
| 1928 | 16.0 | 14.7 | 15.7 | 15.9 | 16.4 | 17.1 | 15.8 | 16.9 | 15.5 | 14.8 | 15.1 | 15.3 | 15.8 |
| 1929 | 15.1 | 15.0 | 14.7 | 13.9 | 13.7 | | | | | | | | |

Bureau of Agricultural Economics. Conversions at monthly average rate of exchange as given in Federal Reserve Bulletins to December, 1925, inclusive; subsequently at par.

¹ International Yearbook of Agricultural Statistics, 1921, p. 443. London Economist, 1922 to date, Average of weekly quotations.

² London Economist, average of weekly quotations to August, 1925, inclusive. Subsequently from Liverpool Cotton Association Daily Report.

TABLE 142.—*Cottonseed: Estimated production and estimated price per ton, December 1, by States, 1922-1929*

| State | Production, year beginning August 1— | | | | | | | | Estimated price per ton | | | | | | | |
|---------------------|--------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | Dol- lars | Dol- lars | Dol- lars | Dol- lars | Dol- lars | Dol- lars | Dol- lars | Dol- lars |
| Missouri..... | 66 | 57 | 86 | 133 | 97 | 51 | 65 | 95 | 36.30 | 38.60 | 32.40 | 36.00 | 16.80 | 36.90 | 35.00 | 31.00 |
| Virginia..... | 12 | 22 | 17 | 23 | 23 | 14 | 19 | 20 | 34.50 | 43.30 | 36.30 | 35.00 | 26.00 | 42.00 | 41.00 | 30.60 |
| North Carolina..... | 378 | 452 | 366 | 488 | 539 | 382 | 371 | 326 | 39.30 | 44.00 | 35.00 | 33.00 | 22.00 | 37.00 | 40.00 | 29.00 |
| South Carolina..... | 218 | 341 | 357 | 394 | 448 | 321 | 322 | 375 | 41.30 | 48.00 | 36.10 | 32.00 | 21.00 | 39.50 | 39.00 | 28.00 |
| Georgia..... | 317 | 261 | 445 | 516 | 664 | 488 | 457 | 597 | 39.70 | 47.90 | 34.10 | 33.00 | 21.00 | 38.50 | 37.00 | 28.00 |
| Florida..... | 12 | 6 | 10 | 17 | 14 | 8 | 9 | 13 | 35.30 | 43.20 | 32.10 | 34.00 | 19.00 | 20.50 | 36.00 | 30.00 |
| Tennessee..... | 174 | 101 | 157 | 229 | 200 | 159 | 190 | 229 | 41.40 | 49.70 | 35.20 | 25.50 | 19.00 | 37.00 | 38.00 | 29.00 |
| Alabama..... | 366 | 260 | 438 | 602 | 605 | 529 | 492 | 593 | 36.60 | 47.60 | 34.30 | 29.00 | 19.00 | 37.00 | 38.00 | 29.00 |
| Mississippi..... | 439 | 268 | 487 | 884 | 838 | 602 | 655 | 851 | 36.60 | 49.30 | 35.70 | 22.00 | 21.00 | 38.50 | 39.00 | 32.50 |
| Arkansas..... | 449 | 276 | 490 | 711 | 687 | 444 | 554 | 662 | 35.30 | 44.40 | 33.20 | 18.30 | 17.50 | 26.50 | 37.50 | 29.00 |
| Louisiana..... | 152 | 163 | 219 | 404 | 308 | 243 | 307 | 360 | 32.30 | 40.70 | 29.20 | 24.50 | 18.00 | 33.00 | 32.50 | 31.00 |
| Oklahoma..... | 279 | 291 | 671 | 751 | 787 | 461 | 536 | 534 | 29.70 | 37.70 | 28.60 | 26.50 | 15.40 | 37.00 | 34.00 | 31.00 |
| Texas..... | 1,433 | 1,927 | 2,197 | 1,849 | 2,499 | 1,938 | 2,274 | 1,759 | 33.50 | 40.10 | 10.31 | 10.25 | 17.50 | 36.00 | 35.00 | 32.00 |
| New Mexico..... | 5 | 14 | 25 | 30 | 33 | 31 | 39 | 37 | 30.00 | 40.50 | 30.00 | 29.00 | 18.00 | 30.00 | 32.00 | 28.00 |
| Arizona..... | 21 | 34 | 48 | 53 | 54 | 41 | 66 | 69 | 25.30 | 40.70 | 21.20 | 26.60 | 18.00 | 30.00 | 30.00 | 26.00 |
| California..... | 12 | 24 | 35 | 54 | 58 | 40 | 76 | 107 | 40.00 | 50.00 | 40.00 | 40.00 | 20.00 | 37.50 | 31.50 | 27.00 |
| All other..... | 3 | 4 | 6 | 11 | 8 | 4 | 3 | 3 | 35.67 | 48.00 | 34.00 | 36.00 | 20.00 | 37.25 | 37.33 | 29.23 |
| United States..... | 4,336 | 4,502 | 6,051 | 7,150 | 7,982 | 5,759 | 6,435 | 6,630 | 35.67 | 43.00 | 32.39 | 27.27 | 18.68 | 36.80 | 36.28 | 30.33 |

Bureau of Agricultural Economics.

¹ Compiled from reports of Bureau of the Census. Estimated production of lint, by States (December preliminary estimate for 1929), in rounded thousands of 500 pounds gross weight bales, adjusting for net weight and assuming 65 pounds of cottonseed for each 35 net pounds of lint.

TABLE 143.—*Cottonseed and cottonseed products: Production in the United States, 1909-1929*

| Year beginning August | Cottonseed | | Cottonseed products | | |
|-----------------------|-----------------------|---------------------|---------------------|---------------------|---------------------|
| | Produced ¹ | Crushed | Crude oil | Cake and meal | Hulls |
| | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons |
| 1909..... | 4,462 | 3,269 | 491 | 1,326 | 1,289 |
| 1910..... | 5,175 | 4,106 | 630 | 1,792 | 1,375 |
| 1911..... | 6,997 | 4,921 | 756 | 2,151 | 1,642 |
| 1912..... | 6,104 | 4,580 | 697 | 1,999 | 1,540 |
| 1913..... | 6,305 | 4,848 | 725 | 2,230 | 1,400 |
| 1914..... | 7,186 | 5,780 | 860 | 2,648 | 1,677 |
| 1915..... | 4,992 | 4,202 | 627 | 1,923 | 1,220 |
| 1916..... | 5,113 | 4,479 | 704 | 2,225 | 969 |
| 1917..... | 5,040 | 4,252 | 656 | 2,068 | 996 |
| 1918..... | 5,360 | 4,479 | 663 | 2,170 | 1,137 |
| 1919..... | 5,074 | 4,013 | 606 | 1,817 | 1,143 |
| 1920..... | 5,971 | 4,069 | 655 | 1,786 | 1,256 |
| 1921..... | 3,531 | 3,008 | 465 | 1,355 | 937 |
| 1922..... | 4,336 | 3,242 | 501 | 1,487 | 944 |
| 1923..... | 4,502 | 3,308 | 490 | 1,518 | 941 |
| 1924..... | 6,051 | 4,605 | 702 | 2,126 | 1,331 |
| 1925..... | 7,150 | 5,558 | 809 | 2,597 | 1,547 |
| 1926..... | 7,982 | 6,306 | 944 | 2,840 | 1,854 |
| 1927..... | 5,759 | 4,654 | 738 | 2,093 | 1,320 |
| 1928..... | 6,435 | 5,069 | 802 | 2,281 | 1,367 |

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census. Production for cottonseed, 1928 estimate of the Department of Agriculture.

¹ Production of cottonseed relates to the preceding crop year.

TABLE 144.—*Cottonseed: Estimated average price per ton, received by producers, United States, 1910-1929*

| Year beginning August | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Weighted average |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1910..... | 26.23 | 26.86 | 25.36 | 25.65 | 26.35 | 25.61 | 25.49 | 26.12 | 25.46 | 23.38 | 22.70 | 25.82 | |
| 1911..... | 20.45 | 18.09 | 16.73 | 16.69 | 16.70 | 16.57 | 16.81 | 18.21 | 18.62 | 19.21 | 19.24 | 19.04 | 17.08 |
| 1912..... | 18.02 | 17.61 | 18.04 | 18.57 | 21.42 | 21.98 | 22.01 | 21.55 | 21.89 | 21.88 | 21.54 | 21.37 | 19.10 |
| 1913..... | 20.24 | 21.07 | 22.01 | 22.46 | 23.48 | 22.70 | 23.37 | 23.60 | 24.17 | 23.56 | 23.62 | 22.78 | 22.39 |
| 1914..... | 20.16 | 13.88 | 15.28 | 14.01 | 17.73 | 19.14 | 23.33 | 22.32 | 22.69 | 22.07 | 20.82 | 20.05 | 16.50 |
| 1915..... | 20.14 | 20.98 | 33.73 | 34.01 | 35.54 | 36.85 | 36.75 | 36.56 | 38.13 | 37.91 | 35.79 | 36.06 | 32.65 |
| 1916..... | 35.22 | 41.13 | 47.19 | 55.82 | 56.35 | 52.53 | 51.43 | 53.18 | 55.94 | 55.61 | 57.19 | 56.90 | 49.13 |
| 1917..... | 56.61 | 57.58 | 65.02 | 69.38 | 68.29 | 67.51 | 66.95 | 68.27 | 68.08 | 68.16 | 66.03 | 64.11 | 66.15 |
| 1918..... | 61.34 | 67.90 | 65.85 | 64.97 | 65.05 | 64.93 | 64.65 | 64.00 | 64.28 | 63.83 | 63.80 | 64.24 | 65.23 |
| 1919..... | 66.23 | 62.13 | 66.95 | 72.65 | 69.07 | 69.88 | 69.34 | 67.18 | 68.71 | 69.88 | 66.16 | 61.64 | 67.27 |
| 1920..... | 43.22 | 20.96 | 28.94 | 26.00 | 19.83 | 18.96 | 19.76 | 18.92 | 17.23 | 17.28 | 17.06 | 18.75 | 22.95 |
| 1921..... | 22.06 | 27.19 | 31.05 | 29.15 | 28.78 | 29.24 | 30.17 | 32.72 | 40.79 | 40.21 | 37.71 | 36.92 | 29.72 |
| 1922..... | 32.44 | 25.37 | 31.79 | 40.18 | 42.93 | 43.35 | 45.16 | 46.32 | 47.60 | 46.58 | 43.14 | 41.42 | 34.70 |
| 1923..... | 37.47 | 40.88 | 40.90 | 45.02 | 45.54 | 44.37 | 43.27 | 41.34 | 40.42 | 40.53 | 39.96 | 39.07 | 42.23 |
| 1924..... | 38.44 | 31.74 | 31.95 | 33.57 | 35.48 | 37.50 | 37.14 | 38.21 | 37.94 | 38.61 | 36.66 | 36.41 | 34.08 |
| 1925..... | 36.52 | 33.48 | 32.82 | 27.64 | 27.87 | 28.40 | 29.06 | 29.47 | 31.51 | 30.84 | 31.89 | 31.31 | 30.82 |
| 1926..... | 29.73 | 27.38 | 20.06 | 18.66 | 18.05 | 18.55 | 22.39 | 25.43 | 25.80 | 26.05 | 26.27 | 26.59 | 21.55 |
| 1927..... | 25.95 | 34.41 | 36.60 | 37.51 | 37.14 | 37.40 | 37.44 | 37.77 | 39.40 | 43.00 | 41.25 | 39.27 | 35.94 |
| 1928..... | 36.87 | 30.98 | 34.08 | 37.17 | 37.74 | 38.05 | 38.73 | 39.36 | 38.94 | 37.78 | 35.83 | 34.94 | 35.39 |
| 1929..... | 32.69 | 31.03 | 31.40 | 30.75 | 30.31 | | | | | | | | |

Bureau of Agricultural Economics. Based upon returns from special-price reporters. Monthly prices weighted by production of cotton for each State; yearly price obtained by weighting monthly prices by monthly receipts at oil mills.

TABLE 145.—*Cottonseed oil, prime summer yellow: Average spot price per pound, in barrels, New York, 1920-1929*

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Average |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1920..... | 12.32 | 13.48 | 11.43 | 10.14 | 8.91 | 8.59 | 7.34 | 6.26 | 6.24 | 7.22 | 7.46 | 8.57 | 9.00 |
| 1921..... | 8.69 | 9.88 | 8.69 | 8.30 | 8.28 | 8.62 | 9.96 | 11.48 | 11.57 | 11.71 | 11.33 | 10.97 | 9.96 |
| 1922..... | 9.96 | 8.54 | 8.88 | 9.51 | 9.81 | 10.77 | 10.90 | 11.78 | 11.76 | 11.60 | 11.48 | 10.35 | 10.44 |
| 1923..... | 10.34 | 11.62 | 12.01 | 11.67 | 11.00 | 11.00 | 10.03 | 9.77 | 10.09 | 9.82 | 10.42 | 11.98 | 10.81 |
| 1924..... | 13.83 | 10.51 | 11.00 | 10.86 | 11.41 | 11.10 | 10.69 | 11.10 | 11.08 | 10.51 | 10.75 | 11.38 | 11.19 |
| 1925..... | 11.09 | 10.81 | 9.86 | 10.32 | 10.47 | 11.33 | 11.28 | 12.24 | 12.38 | 14.48 | 15.38 | 14.99 | 12.05 |
| 1926..... | 12.99 | 11.42 | 8.82 | 8.20 | 8.22 | 8.50 | 9.31 | 9.39 | 8.78 | 9.09 | 9.19 | 9.57 | 9.46 |
| 1927..... | 9.89 | 10.74 | 10.83 | 10.55 | 10.06 | 10.02 | 9.27 | 9.64 | 10.04 | 10.52 | 10.22 | 10.03 | 10.15 |
| 1928..... | 9.44 | 10.03 | 9.84 | 9.69 | 10.21 | 10.33 | 10.88 | 10.74 | 10.11 | 9.75 | 9.64 | 9.62 | 10.02 |
| 1929..... | 9.27 | 9.19 | 9.23 | | 8.77 | | | | | | | | |

Bureau of Agricultural Economics. 1920-21, from annual reports of the New York Produce Exchange, subsequently compiled from Oil, Paint, and Drug Reporter average of daily ranges. Data for 1890-1919 are available in 1924 Yearbook, p. 766, Table 323.

TABLE 146.—*Cottonseed meal, 41 per cent protein: Price per ton, Memphis, 1920-1929*

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Average |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1920..... | | | | 36.30 | 30.80 | 30.20 | 29.20 | 27.00 | | 29.00 | 32.80 | 35.00 | |
| 1921..... | | 38.20 | 35.70 | 35.00 | 36.30 | 37.10 | 39.30 | 45.10 | 47.60 | 49.25 | 47.50 | 44.75 | |
| 1922..... | 35.30 | 34.30 | 40.25 | 46.00 | 45.40 | 45.75 | 40.00 | 43.60 | 43.10 | 42.40 | 40.80 | 41.40 | 41.90 |
| 1923..... | 43.20 | 42.90 | 44.90 | 47.40 | 45.00 | 43.60 | 41.00 | 39.60 | 39.50 | 39.50 | 40.25 | 43.60 | 42.50 |
| 1924..... | 43.60 | 41.40 | 40.75 | 38.75 | 39.25 | 37.70 | 35.75 | 35.90 | 36.80 | 38.40 | 38.80 | 41.50 | 39.00 |
| 1925..... | 44.10 | 36.90 | 34.40 | 34.10 | 34.00 | 32.60 | 31.10 | 31.00 | 31.90 | 30.70 | 31.00 | 31.10 | 33.60 |
| 1926..... | 32.10 | 28.90 | 23.90 | 23.70 | 24.50 | 30.10 | 33.50 | 32.40 | 32.50 | 34.00 | 37.40 | 36.00 | 30.75 |
| 1927..... | (1) | 37.40 | 37.70 | 39.60 | 41.40 | 40.40 | 45.10 | 49.30 | 55.50 | 61.50 | (1) | 41.50 | |
| 1928..... | (1) | 38.40 | 43.90 | 44.20 | 45.60 | 44.90 | 44.40 | 42.70 | 38.75 | 35.50 | 34.25 | 38.75 | |
| 1929..... | (1) | 41.00 | 39.30 | 37.80 | 37.00 | | | | | | | | |

Bureau of Agricultural Economics. Compiled from reports made to the bureau.

¹ Not reported.

TABLE 147.—*Cottonseed meal, 41 per cent protein, bagged: Average price per ton at 10 markets, 1929*

| Market | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| Boston..... | 54.00 | 53.60 | 51.75 | 48.00 | 45.20 | 43.70 | 46.25 | 47.40 | 48.80 | 47.50 | 46.40 | 45.25 |
| Philadelphia..... | 52.60 | 52.40 | 50.70 | 46.60 | 43.80 | 42.60 | 46.40 | 46.40 | 48.60 | 47.10 | 45.75 | 44.75 |
| Buffalo..... | 51.20 | 50.50 | 49.00 | 45.00 | 42.10 | 40.70 | 44.40 | 45.50 | 47.00 | 45.40 | 43.90 | 43.40 |
| Pittsburgh..... | 50.25 | 50.00 | 48.70 | 45.20 | 42.40 | 40.40 | 43.40 | 44.30 | 47.00 | 45.60 | 43.90 | 43.75 |
| Cincinnati..... | 49.60 | 49.00 | 47.50 | 43.60 | 40.90 | 39.40 | 43.00 | 43.75 | 46.00 | 44.80 | 43.20 | 42.00 |
| Chicago..... | 49.40 | 48.90 | 47.50 | 44.00 | 41.10 | 39.20 | 42.60 | 43.60 | 46.00 | 43.70 | 42.50 | 41.40 |
| Milwaukee..... | 47.20 | 47.90 | 47.40 | 44.10 | 42.90 | 40.60 | 43.60 | 43.70 | 46.25 | 44.75 | 43.50 | 43.50 |
| Minneapolis..... | 50.30 | 49.75 | 48.50 | 45.75 | 43.00 | ----- | ----- | 44.80 | 47.10 | 46.10 | 44.60 | 44.00 |
| Los Angeles..... | 44.00 | 44.00 | 43.75 | 43.70 | 43.00 | 42.00 | 41.75 | 44.00 | 42.25 | 43.00 | 42.25 | ----- |
| St. Louis..... | ----- | ----- | 46.00 | 43.00 | 39.60 | 37.90 | 41.30 | 43.20 | 45.10 | 42.40 | 41.30 | 40.50 |

Bureau of Agricultural Economics. Compiled from reports made to the bureau.

1 40% protein.

TABLE 148.—*Cottonseed oil: International trade, average 1909-1913, annual 1925-1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|--------------------|----------|----------|----------|----------|----------|----------|----------|-------------------|----------|
| | Average 1909-1913 | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | | | | | | | | | | |
| United States..... | 1,471,500 | 292,257 | 1,000 | 62,415 | 1,000 | 40,901 | 0 | 67,982 | 0 | 51,702 |
| United Kingdom..... | 44,246 | 53,920 | 11,198 | 44,092 | 24,940 | 50,082 | 17,315 | 47,044 | 16,735 | 35,797 |
| Egypt..... | 1,927 | 3,568 | 391 | 8,101 | 1 | 30,532 | 0 | 31,229 | 0 | 17,579 |
| Peru..... | 0 | 2,158 | 0 | 7,309 | 0 | 10,601 | 0 | 15,596 | 0 | 11,077 |
| China..... | 0 | 2,110 | 0 | 4,903 | 0 | 0 | 0 | 0 | ----- | ----- |
| Brazil..... | 4,680 | 112 | 69 | 1,639 | 25 | 97 | ----- | ----- | ----- | ----- |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| Canada..... | 21,131 | 0 | 30,136 | 0 | 29,939 | 0 | 54,118 | 0 | 44,254 | 0 |
| Netherlands..... | 40,141 | 392 | 22,643 | 5,016 | 20,985 | 6,472 | 24,370 | 9,838 | 8,685 | 7,264 |
| Germany..... | 51,884 | 0 | 30,652 | 38 | 13,298 | 164 | 25,897 | 34 | 12,984 | 20 |
| France..... | 24,666 | 2,509 | 7,910 | 35 | 8,189 | 28 | 7,597 | 55 | 7,767 | 3 |
| Norway..... | 11,284 | 0 | 5,102 | 0 | 6,239 | 0 | 5,582 | 0 | 2,798 | 0 |
| Denmark..... | 7,081 | 0 | 4,721 | 287 | 8,398 | 558 | 6,131 | 609 | 6,530 | 0 |
| Belgium..... | 16,884 | 8,143 | 2,689 | 0 | 1,984 | 7 | 3,918 | 4 | 2,026 | 51 |
| Argentina..... | 7,510 | 12 | 1,838 | 2 | 768 | 10 | 2,461 | 210 | ----- | ----- |
| Sweden..... | 5,220 | 120 | 1,545 | 184 | 3,490 | 432 | 3,295 | 1,097 | 2,721 | 49 |
| Greece..... | 0 | 0 | 1,300 | 0 | 1,078 | 0 | 3,315 | 0 | 1,201 | 0 |
| Australia..... | 1,062 | 0 | 2,800 | 2 | 1,489 | 2 | 1,709 | 3 | ----- | ----- |
| Czechoslovakia..... | 0 | 0 | 281 | 0 | 312 | 0 | 130 | 0 | 282 | 0 |
| Uruguay..... | 2,938 | 0 | 146 | 0 | 382 | 0 | 565 | 0 | ----- | ----- |
| Italy..... | 34,408 | 6 | 105 | 2 | 233 | 1 | 59 | 1 | 327 | 0 |
| Algeria..... | 2,728 | 1,177 | 3 | 46 | 63 | 68 | 85 | 26 | ----- | ----- |
| Total 21 countries..... | 283,595 | 364,284 | 121,529 | 134,069 | 121,803 | 139,953 | 156,547 | 173,728 | 106,310 | 123,542 |

Bureau of Agricultural Economics. Official sources except where otherwise noted.

1 3-year average.

2 International Yearbook of Agricultural Statistics.

3 4-year average.

4 1 year only.

TABLE 149.—*Cottonseed oil, crude: Average price per pound, f. o. b. mills, 1909-1929*¹

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Average |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1909 | 5.01 | 4.82 | 5.63 | 5.97 | 6.32 | 6.18 | 6.12 | 6.46 | 7.03 | 7.12 | 7.27 | 7.27 | 6.27 |
| 1910 | 7.00 | 6.44 | 6.17 | 6.20 | 6.14 | 5.80 | 5.55 | 5.20 | 5.43 | 5.47 | 4.88 | ----- | ----- |
| 1911 | 4.27 | 4.80 | 4.38 | 4.40 | 4.15 | 4.36 | 4.52 | 4.60 | 5.48 | 6.22 | 5.80 | 5.30 | 4.86 |
| 1912 | 5.24 | 4.95 | 4.84 | 5.02 | 5.27 | 5.22 | 5.36 | 5.44 | 6.03 | 5.87 | 6.23 | 6.20 | 5.47 |
| 1913 | 6.10 | 6.18 | 5.94 | 6.06 | 5.83 | 6.10 | 6.16 | 6.30 | 6.60 | 6.53 | 6.26 | 6.40 | 6.20 |
| 1914 | 5.26 | 5.36 | 4.71 | 4.54 | 4.44 | 5.15 | 5.81 | 6.00 | 5.60 | 5.10 | 5.09 | 4.83 | 5.16 |
| 1915 | 4.40 | 5.41 | 6.67 | 6.64 | 7.31 | 7.71 | 7.67 | 8.72 | 9.18 | 9.61 | 9.54 | 9.20 | 7.67 |
| 1916 | 8.85 | 8.82 | 10.10 | 11.35 | 11.35 | 11.10 | 11.20 | 11.64 | 13.20 | 14.10 | 14.67 | 14.00 | 11.70 |
| 1917 | 13.92 | 13.86 | 15.93 | 17.40 | 17.33 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 16.74 |
| 1918 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 21.56 | 21.75 | 18.19 |
| 1919 | 21.75 | 17.38 | 16.25 | 18.95 | 18.46 | 19.74 | 18.25 | 17.69 | 16.19 | 15.62 | 15.50 | 11.50 | 17.27 |
| 1920 | 10.00 | 10.25 | 10.35 | 7.08 | 6.19 | 6.10 | 5.80 | 4.70 | 4.43 | 5.34 | 5.74 | 6.76 | 6.90 |
| 1921 | 6.75 | 7.81 | 7.26 | 7.00 | 7.02 | 7.16 | 8.28 | 10.15 | 9.80 | 10.00 | 9.75 | 8.88 | 8.32 |
| 1922 | 8.50 | 6.46 | 7.34 | 8.30 | 8.52 | 9.84 | 9.92 | 10.45 | 10.25 | 9.88 | 9.75 | 9.00 | 9.02 |
| 1923 | ----- | 9.94 | 9.44 | 9.88 | 9.45 | 9.46 | 8.84 | 8.46 | 8.74 | 8.20 | 8.78 | 10.06 | ----- |
| 1924 | 11.30 | 8.34 | 9.03 | 8.85 | 9.69 | 9.48 | 9.20 | 9.95 | 10.00 | 9.34 | 9.75 | ----- | ----- |
| 1925 | ----- | 9.14 | 8.55 | 8.90 | 8.98 | 9.75 | 10.71 | 11.00 | 11.22 | 12.17 | ----- | ----- | ----- |
| 1926 | 10.88 | 8.19 | 7.44 | 6.64 | 6.36 | 6.94 | 5.20 | 7.73 | 7.33 | 7.74 | 8.04 | ----- | ----- |
| 1927 | 8.70 | 9.25 | 9.45 | 9.05 | 8.72 | 8.48 | 7.75 | 8.44 | 8.75 | 8.88 | ----- | ----- | ----- |
| 1928 | ----- | 8.16 | 8.14 | 8.24 | 8.38 | 8.63 | 9.12 | 9.00 | 8.37 | 7.94 | ----- | ----- | ----- |
| 1929 | ----- | 7.66 | 7.33 | 7.38 | 7.26 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Prices 1909-1912 and 1919-1928 are averages of weekly quotations in the Oil, Paint, and Drug Reporter; 1913-1918 from War Industries Board Price Bulletin No. 15. Beginning August, 1928, prices are average of daily quotations.

¹ Quoted as follows: Prior to 1922 as f. o. b. mills; 1922, southeastern, pounds; 1923-1927, southeastern, tanks; beginning August, 1928, immediate southeastern.

TABLE 150.—*Sugar beets: Acreage, production, yield per acre, price per ton, and value by States, 1925-1929*

| State | Acreage | | | | | Production | | | | |
|-------------------------------------|-------------|-------------|-------------|-------------|-------------|------------------|------------------|------------------|------------------|------------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons |
| Ohio | 43 | 35 | 37 | 38 | 22 | 427 | 340 | 325 | 266 | 185 |
| Michigan | 99 | 100 | 99 | 71 | 50 | 969 | 793 | 698 | 452 | 287 |
| Wisconsin | 15 | 17 | 11 | 8 | 9 | 168 | 158 | 90 | 74 | 65 |
| Nebraska | 60 | 79 | 82 | 86 | 92 | 933 | 923 | 1,036 | 1,021 | 1,062 |
| Montana | 30 | 32 | 32 | 28 | 37 | 309 | 348 | 364 | 258 | 362 |
| Wyoming | 29 | 36 | 37 | 44 | 49 | 364 | 388 | 431 | 462 | 499 |
| Idaho | 36 | 18 | 29 | 27 | 52 | 456 | 108 | 381 | 297 | 565 |
| Colorado | 130 | 211 | 218 | 179 | 230 | 1,640 | 2,912 | 2,774 | 2,394 | 2,880 |
| Utah | 69 | 51 | 55 | 51 | 46 | 1,064 | 415 | 677 | 637 | 564 |
| California | 76 | 46 | 59 | 49 | 48 | 488 | 369 | 476 | 638 | 544 |
| Other States | 60 | 52 | 62 | 63 | 82 | 563 | 469 | 501 | 602 | 659 |
| United States | 647 | 677 | 721 | 644 | 717 | 7,381 | 7,223 | 7,753 | 7,101 | 7,672 |
| Canada, for United States factories | 6 | 10 | 11 | 2 | 8 | 57 | 77 | 69 | 10 | 42 |

| State | Yield per acre | | | | | Price per ton received by producers | | | | | Value | | | | |
|------------------------------------|----------------|------------|------------|------------|------------|-------------------------------------|---------|---------|---------|---------|---------------|---------------|---------------|---------------|---------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 | 1925 | 1926 | 1927 | 1928 | 1929 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | Short tons | Short tons | Short tons | Short tons | Short tons | Dollars | Dollars | Dollars | Dollars | Dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Ohio | 9.9 | 9.7 | 8.8 | 7.0 | 8.5 | 6.90 | 7.00 | 7.00 | 7.13 | ----- | 2,945 | 2,383 | 2,272 | 1,897 | ----- |
| Michigan | 9.8 | 7.9 | 7.0 | 6.4 | 5.7 | 7.05 | 7.00 | 7.16 | 7.22 | ----- | 6,833 | 5,552 | 4,996 | 3,263 | ----- |
| Wisconsin | 11.2 | 9.3 | 8.2 | 9.2 | 7.2 | 7.25 | 7.24 | 7.00 | 7.35 | ----- | 1,218 | 1,141 | 633 | 543 | ----- |
| Nebraska | 15.6 | 11.7 | 12.6 | 11.9 | 11.5 | 5.97 | 7.89 | 7.96 | 6.98 | ----- | 5,574 | 7,274 | 8,241 | 7,127 | ----- |
| Montana | 10.3 | 10.9 | 11.4 | 9.2 | 9.7 | 6.35 | 8.09 | 8.22 | 7.36 | ----- | 1,960 | 2,814 | 2,996 | 1,897 | ----- |
| Wyoming | 12.6 | 10.5 | 11.6 | 10.5 | 10.2 | 6.18 | 7.06 | 7.67 | 7.44 | ----- | 2,253 | 2,743 | 3,303 | 2,210 | ----- |
| Idaho | 12.7 | 6.0 | 13.1 | 11.0 | 11.0 | 6.24 | 6.91 | 7.50 | 7.21 | ----- | 2,846 | 744 | 2,854 | 3,326 | ----- |
| Colorado | 12.6 | 13.8 | 12.7 | 13.4 | 12.5 | 5.98 | 7.92 | 7.84 | 6.97 | ----- | 9,815 | 23,050 | 21,758 | 16,687 | ----- |
| Utah | 15.4 | 8.1 | 12.3 | 12.5 | 12.2 | 6.03 | 6.97 | 7.03 | 7.03 | ----- | 6,416 | 2,894 | 4,761 | 4,478 | ----- |
| California | 6.4 | 8.0 | 8.1 | 13.0 | 11.2 | 8.21 | 9.25 | 9.28 | 8.03 | ----- | 4,005 | 3,411 | 4,418 | 5,121 | ----- |
| Other States | 9.4 | 9.0 | 8.1 | 9.6 | 8.0 | 5.83 | 6.31 | 6.43 | 6.53 | ----- | 3,282 | 2,958 | 3,223 | 3,928 | ----- |
| United States | 11.4 | 10.7 | 10.8 | 11.0 | 10.7 | 6.39 | 7.61 | 7.67 | 7.11 | ----- | 47,147 | 54,964 | 59,455 | 50,477 | ----- |
| Canada for United States factories | 9.5 | 7.7 | 6.3 | 5.0 | 5.4 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

TABLE 151.—*Sugar beets: Production, United States, 1911-1929*¹

| Year | Acre-age | Yield | Production | Price per ton | Value | Year | Acre-age | Yield | Production | Price per ton | Value |
|-----------|-------------|------------|------------------|---------------|---------------|-------------------------|-------------|------------|------------------|---------------|---------------|
| | 1,000 acres | Short tons | 1,000 short tons | Dollars | 1,000 dollars | | 1,000 acres | Short tons | 1,000 short tons | Dollars | 1,000 dollars |
| 1911..... | 474 | 10.7 | 5,062 | 5.50 | 27,841 | 1921..... | 815 | 9.6 | 7,782 | 6.35 | 49,392 |
| 1912..... | 555 | 10.2 | 5,648 | 5.82 | 32,871 | 1922..... | 530 | 9.8 | 5,183 | 7.91 | 41,017 |
| 1913..... | 580 | 10.1 | 5,886 | 5.69 | 33,491 | 1923..... | 657 | 10.7 | 7,006 | 8.99 | 62,965 |
| 1914..... | 483 | 11.6 | 5,585 | 5.45 | 30,438 | 1924..... | 815 | 9.2 | 7,489 | 7.99 | 59,838 |
| 1915..... | 611 | 10.7 | 6,511 | 5.67 | 36,950 | 1925..... | 647 | 11.4 | 7,381 | 6.39 | 47,147 |
| 1916..... | 665 | 9.4 | 6,228 | 6.12 | 38,139 | 1926..... | 677 | 10.7 | 7,223 | 7.61 | 54,964 |
| 1917..... | 665 | 9.0 | 5,980 | 7.39 | 44,192 | 1927..... | 721 | 10.8 | 7,753 | 7.67 | 59,455 |
| 1918..... | 594 | 10.0 | 5,949 | 10.00 | 59,494 | 1928..... | 644 | 11.0 | 7,101 | 7.11 | 50,477 |
| 1919..... | 692 | 9.3 | 6,421 | 11.74 | 75,420 | 1929 ² | 717 | 10.7 | 7,672 | 7.52 | 57,679 |
| 1920..... | 872 | 9.8 | 8,538 | 11.63 | 99,324 | | | | | | |

Bureau of Agricultural Economics.

¹ Most years from 1911-1923 include a small unknown quantity of beets grown in Canada for Michigan factories.² Preliminary.TABLE 152.—*Beet sugar: Production, United States, 1911-1929*¹

| Year ¹ | Factories operating | Acreage from which beets were harvested ¹ | Beets paid for by factories | Beets sliced | Sugar produced (chiefly refined) | Analysis of beets | | Recovery of sucrose from beets ² | | Sugar produced per ton of beets | |
|-------------------------|---------------------|--|-----------------------------|------------------|----------------------------------|---------------------------------|------------------------------------|---|----------|---------------------------------|--------|
| | | | | | | Purity coefficient ⁴ | Percentage of sucrose ³ | Paid for | Sliced | Paid for | Sliced |
| | Number | 1,000 acres | 1,000 short tons | 1,000 short tons | 1,000 short tons | Per cent | Per cent | Per cent | Per cent | Pounds | Pounds |
| 1911..... | 66 | 474 | 5,062 | 5,062 | 600 | 82.21 | 15.80 | 11.84 | 11.84 | 237 | 237 |
| 1912..... | 73 | 555 | 5,224 | 5,224 | 693 | 84.49 | 16.31 | 13.26 | 13.26 | 265 | 265 |
| 1913..... | 71 | 580 | 5,650 | 5,650 | 733 | 83.22 | 15.78 | 12.45 | 12.96 | 249 | 250 |
| 1914..... | 60 | 483 | 5,585 | 5,288 | 722 | 83.89 | 16.38 | 12.93 | 13.65 | 250 | 273 |
| 1915..... | 67 | 611 | 6,511 | 6,150 | 874 | 84.38 | 16.49 | 13.42 | 14.21 | 268 | 284 |
| 1916..... | 74 | 665 | 6,228 | 5,920 | 821 | 84.74 | 16.30 | 13.18 | 13.86 | 264 | 277 |
| 1917..... | 91 | 665 | 5,980 | 5,626 | 765 | 83.89 | 16.28 | 12.79 | 13.60 | 256 | 272 |
| 1918..... | 89 | 594 | 5,949 | 5,578 | 761 | 84.70 | 16.18 | 12.79 | 13.64 | 256 | 273 |
| 1919..... | 89 | 692 | 6,421 | 5,888 | 726 | 82.84 | 14.48 | 11.31 | 12.34 | 226 | 247 |
| 1920..... | 97 | 872 | 8,538 | 7,991 | 1,089 | 83.96 | 15.99 | 12.75 | 13.63 | 255 | 273 |
| 1921..... | 92 | 815 | 7,782 | 7,414 | 1,020 | 83.09 | 15.77 | 13.11 | 13.76 | 262 | 275 |
| 1922..... | 81 | 530 | 5,183 | 4,963 | 875 | 83.76 | 15.44 | 13.02 | 13.61 | 260 | 272 |
| 1923..... | 80 | 657 | 7,006 | 6,585 | 881 | 83.43 | 15.30 | 12.57 | 13.37 | 251 | 267 |
| 1924..... | 90 | 817 | 7,013 | 7,075 | 1,090 | 85.03 | 17.19 | 14.51 | 15.41 | 280 | 306 |
| 1925..... | 88 | 653 | 7,423 | 6,993 | 913 | 82.84 | 14.86 | 12.30 | 13.06 | 246 | 261 |
| 1926..... | 78 | 687 | 7,300 | 6,782 | 897 | 84.03 | 14.94 | 12.29 | 13.23 | 246 | 265 |
| 1927..... | 83 | 732 | 7,821 | 7,443 | 1,093 | 84.60 | 16.11 | 13.98 | 14.08 | 280 | 294 |
| 1928..... | 82 | 646 | 7,111 | 6,880 | 1,061 | 85.52 | 16.73 | 14.92 | 15.42 | 298 | 308 |
| 1929 ² | 725 | 7,714 | 7,714 | 7,714 | 1,041 | 15.67 | 13.49 | 13.49 | 13.49 | 270 | 270 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Figures for important States in recent years published in *Crops and Markets*, December, 1929, p. 475.² Year shown is that in which beets were grown. Sugar-making campaign extends into succeeding year.³ Including, in some years, a small acreage in Canada used by U. S. factories.⁴ Percentages of sucrose (pure sugar) in the total soluble solids of the beets.⁵ Based upon weight of beets sliced, except possibly in a very few factories.⁶ Sucrose actually extracted by/ factories (as percentage of weight of beets).⁷ Preliminary.

TABLE 153.—*Cane sugar: Production in Louisiana, 1911-1929*

| Year ¹ | Facto- ries oper- ating | Cane used for sugar | | | Sugar produced | | Re- covery of equiv- alent re- fined sug- ar from cane ground ¹ | Sugar made per ton of cane | Molasses made | | |
|-------------------|-------------------------------|---------------------|--------------------------------------|-----------------|----------------|---|---|---|--------------------|-----------------------------------|----------------------------------|
| | | Acreage | Aver- age yield per acre | Produc- tion | As made | Equiv- alent refined ² | | | Total ⁴ | Per ton of sugar made | Per ton of cane used |
| | | Number | Acres | Short tons | Short tons | Short tons | Per cent | Pounds | Gallons | Gal- lons | Gal- lons |
| 1911 | 188 | 310,000 | 19.0 | 5,887,292 | 352,874 | 328,879 | 5.59 | 120 | 33,062,525 | 99 | 6.0 |
| 1912 | 126 | 197,000 | 11.0 | 2,162,574 | 153,573 | 143,130 | 6.62 | 142 | 14,302,169 | 93 | 6.6 |
| 1913 | 153 | 248,000 | 17.0 | 4,214,000 | 292,698 | 272,795 | 6.47 | 139 | 24,046,320 | 82 | 5.7 |
| 1914 | 149 | 213,000 | 15.0 | 3,199,000 | 242,700 | 226,200 | 7.07 | 152 | 17,177,443 | 71 | 5.4 |
| 1915 | 136 | 183,000 | 11.0 | 2,018,000 | 137,500 | 128,200 | 6.35 | 135 | 12,743,000 | 93 | 6.3 |
| 1916 | 150 | 221,000 | 18.0 | 4,072,000 | 303,900 | 283,200 | 6.95 | 149 | 26,154,000 | 86 | 6.4 |
| 1917 | 140 | 244,000 | 15.6 | 3,813,000 | 243,600 | 227,000 | 5.95 | 128 | 30,728,000 | 126 | 8.1 |
| 1918 | 134 | 231,200 | 18.0 | 4,170,000 | 280,900 | 261,800 | 6.28 | 135 | 28,049,000 | 100 | 6.7 |
| 1919 | 121 | 179,900 | 10.5 | 1,883,000 | 121,000 | 112,900 | 5.99 | 129 | 12,991,000 | 107 | 6.9 |
| 1920 | 122 | 182,843 | 13.6 | 2,492,524 | 169,127 | 157,626 | 6.32 | 136 | 16,856,867 | 100 | 6.8 |
| 1921 | 124 | 226,366 | 18.5 | 4,180,780 | 324,431 | 302,370 | 7.23 | 155 | 25,423,341 | 78 | 6.1 |
| 1922 | 112 | 241,433 | 15.6 | 3,778,110 | 295,065 | 275,029 | 7.28 | 156 | 22,718,640 | 77 | 6.0 |
| 1923 | 105 | 217,259 | 11.1 | 2,386,650 | 162,023 | 151,005 | 6.33 | 136 | 15,719,400 | 97 | 6.6 |
| 1924 | 82 | 163,000 | 7.6 | 1,228,000 | 88,000 | 82,000 | 6.68 | 114 | 9,590,000 | 109 | 7.8 |
| 1925 | 91 | 190,000 | 14.0 | 2,645,000 | 139,000 | 130,000 | 4.91 | 105 | 17,783,000 | 128 | 6.7 |
| 1926 | 54 | 128,000 | 6.8 | 844,000 | 47,000 | 44,000 | 5.09 | 109 | 6,614,000 | 141 | 7.7 |
| 1927 | 46 | 73,000 | 13.4 | 962,000 | 71,000 | 66,000 | 6.86 | 147 | 6,624,000 | 93 | 6.9 |
| 1928 | 55 | 115,000 | 16.2 | 1,860,000 | 132,000 | 123,000 | 6.61 | 122 | 13,535,000 | 103 | 7.3 |
| 1929 ⁵ | ----- | 173,000 | 16.0 | 2,788,000 | 208,000 | 194,000 | 7.01 | 150 | 15,750,000 | 76 | 5.7 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Sugar campaign, usually not ended before February following season of growth of cane.² One ton of sugar as made is assumed to be equivalent to 0.932 tons of refined as tentatively recommended by the joint committee on sugar statistics of the Department of Commerce and the Department of Agriculture.³ Based upon tonnage of cane used.⁴ Figures for molasses, 1911-1914, are as reported by the Louisiana Sugar Planters' Association; Figures for later years as reported by Division of Crop and Livestock Estimates.⁵ Preliminary.TABLE 154.—*Cane sugar: Production of Hawaii, 1914-1929*

| Year ending Sept. 30 | Total acreage in cane | Cane used for sugar | | | Sugar produced | | Sugar made per short ton of cane | Recovery of equiv- alent re- fined sug- ar from cane ground ¹ |
|-------------------------|-----------------------------|---------------------------|------------------------------|------------|----------------|---|--|--|
| | | Acreage har- vested | Average yield per acre | Production | As made | Equiv- alent refined ¹ | | |
| | Acres | Acres | Short tons | Short tons | Short tons | Short tons | Pounds | Per cent |
| 1914 | ----- | 112,700 | 43 | 4,900,000 | 612,000 | 573,000 | 250 | 11.69 |
| 1915 | 239,800 | 113,200 | 46 | 5,185,000 | 646,000 | 605,000 | 249 | 11.67 |
| 1916 | 246,332 | 115,419 | 42 | 4,859,424 | 592,763 | 554,708 | 244 | 11.42 |
| 1917 | 245,100 | 123,900 | 42 | 5,220,000 | 644,663 | 603,276 | 247 | 11.56 |
| 1918 | 276,800 | 119,800 | 41 | 4,855,000 | 576,790 | 539,676 | 238 | 11.12 |
| 1919 | 239,900 | 119,700 | 40 | 4,744,000 | 600,312 | 561,772 | 253 | 11.84 |
| 1920 | 247,900 | 114,100 | 39 | 4,473,000 | 555,727 | 520,049 | 248 | 11.63 |
| 1921 | 236,500 | 113,100 | 41 | 4,657,000 | 521,579 | 488,064 | 224 | 10.48 |
| 1922 | 229,000 | 124,000 | 41 | 5,088,000 | 592,000 | 554,000 | 233 | 10.80 |
| 1923 | 235,000 | 114,000 | 40 | 4,560,000 | 537,000 | 503,800 | 235 | 11.03 |
| 1924 | 232,000 | 111,000 | 51 | 5,661,000 | 691,000 | 647,000 | 244 | 11.43 |
| 1925 | 241,000 | 122,000 | 52 | 6,297,000 | 760,000 | 720,000 | 244 | 11.43 |
| 1926 ² | 237,774 | 122,309 | 53 | 6,495,686 | 787,246 | 736,705 | 242 | 11.34 |
| 1927 ² | 234,809 | 124,542 | 56 | 6,992,082 | 811,333 | 759,245 | 232 | 10.86 |
| 1928 ² | 240,769 | 131,534 | 59 | 7,707,330 | 896,918 | 839,336 | 233 | 10.89 |
| 1929 ² | ----- | ----- | ----- | ----- | 913,870 | 855,012 | ----- | ----- |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ 1 ton of sugar as made is assumed to be equivalent to 0.9358 tons of refined, as tentatively recommended by the joint committee on sugar statistics of the Department of Commerce and the Department of Agriculture.² Based upon tonnage of cane used.³ Data collected through the Hawaiian Sugar Planters' Association.

TABLE 155.—*Sugar: Production in the United States and its possessions, 1909–1929*

| Year beginning July | Total cane and beet sugar (refined) ¹ | Beet sugar (chiefly refined) | Cane sugar (chiefly raw) | | | | |
|-------------------------|--|------------------------------|---------------------------|-------------------|-------------------|---------------------------------|-------------------|
| | | | Continental United States | Porto Rico | Hawaii | Philippine Islands ² | Total |
| | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> |
| 1909..... | 1,765,011 | 512,469 | 331,726 | 346,786 | 517,090 | 140,783 | 1,336,385 |
| 1910..... | 1,856,530 | 510,172 | 355,040 | 349,840 | 566,821 | 164,658 | 1,436,359 |
| 1911..... | 2,036,018 | 509,500 | 360,874 | 371,076 | 595,038 | 205,046 | 1,532,034 |
| 1912..... | 2,057,179 | 692,556 | 162,573 | 398,004 | 546,524 | 345,077 | 1,452,178 |
| 1913..... | 2,304,454 | 733,401 | 300,538 | 351,666 | 612,000 | 408,339 | 1,672,543 |
| 1914..... | 2,282,021 | 722,054 | 216,620 | 346,490 | 646,000 | 421,192 | 1,660,302 |
| 1915..... | 2,404,018 | 874,220 | 138,620 | 483,590 | 592,763 | 412,274 | 1,627,247 |
| 1916..... | 2,590,239 | 820,657 | 310,900 | 503,081 | 614,663 | 425,266 | 1,883,910 |
| 1917..... | 2,411,263 | 765,207 | 245,840 | 453,794 | 576,700 | 474,745 | 1,751,079 |
| 1918..... | 2,390,820 | 760,950 | 284,400 | 406,002 | 600,312 | 453,346 | 1,744,006 |
| 1919..... | 2,259,513 | 726,451 | 122,125 | 485,071 | 555,727 | 468,912 | 1,629,835 |
| 1920..... | 2,779,413 | 1,080,021 | 176,114 | 489,818 | 521,579 | 608,499 | 1,790,010 |
| 1921..... | 2,769,970 | 1,020,489 | 327,701 | 408,325 | 592,000 | 533,189 | 1,861,215 |
| 1922..... | 2,260,865 | 675,000 | 295,735 | 379,172 | 537,000 | 475,325 | 1,687,232 |
| 1923..... | 2,604,292 | 881,000 | 164,823 | 447,570 | 691,000 | 529,091 | 1,832,484 |
| 1924..... | 3,252,951 | 1,090,000 | 88,493 | 660,411 | 769,000 | 779,510 | 2,297,404 |
| 1925..... | 2,923,225 | 913,000 | 139,381 | 603,210 | 787,246 | 607,362 | 2,137,229 |
| 1926..... | 3,019,707 | 897,000 | 47,160 | 629,134 | 811,333 | 766,902 | 2,254,535 |
| 1927..... | 3,468,069 | 1,093,000 | 70,792 | 748,677 | 896,918 | 807,814 | 2,622,621 |
| 1928..... | 3,371,720 | 1,091,000 | 132,053 | 586,761 | 913,670 | 822,621 | 2,524,201 |
| 1929 (preliminary)..... | 3,585,532 | 1,041,000 | 208,271 | 743,147 | 913,000 | 840,000 | 2,704,418 |

Bureau of Agricultural Economics. Cane sugar production 1909–1910 from Willett & Gray; 1911 and subsequently from United States Department of Agriculture. Hawaiian production from Hawaiian Sugar Planters' Association. Figures for earlier years appear in previous issues of the Yearbook.

¹ Cane sugar, raw, converted to refined basis by multiplying by the following factors: Louisiana and other States, 0.932; Porto Rico, 0.9393; Hawaii, 0.9358; Philippine Islands, 0.95.

² Exports 1909–1911, production 1912 and subsequently.

³ Unofficial estimate of commercial crop.

⁴ Unofficial.

TABLE 156.—*Sugar beets: Acreage, yield per acre and production in specified countries, 1927–1929*

| Country | Acreage | | | Yield per acre | | | Production | | |
|--|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|-------------------------|-------------------------|-------------------------|
| | 1927 | 1928 | 1929, preliminary | 1927 | 1928 | 1929, preliminary | 1927 | 1928 | 1929, preliminary |
| | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>1,000 short tons</i> | <i>1,000 short tons</i> | <i>1,000 short tons</i> |
| Canada..... | 44 | 51 | 43 | 8.9 | 8.5 | 7.8 | 391 | 433 | 334 |
| United States..... | 721 | 644 | 717 | 10.8 | 11.0 | 10.7 | 7,753 | 7,101 | 7,672 |
| United Kingdom..... | 233 | 178 | 231 | 7.2 | 8.8 | 9.0 | 1,683 | 1,561 | 2,089 |
| Sweden..... | 101 | 100 | 62 | 10.8 | 12.1 | 11.7 | 1,095 | 1,208 | 726 |
| Denmark..... | 105 | 113 | 74 | 11.5 | 12.5 | 12.2 | 1,207 | 1,414 | 904 |
| Netherlands..... | 173 | 162 | 133 | 11.6 | 15.6 | 13.6 | 2,013 | 2,523 | 1,808 |
| Belgium..... | 175 | 158 | 141 | 12.5 | 12.8 | 11.6 | 2,186 | 2,015 | 1,639 |
| France..... | 590 | 621 | 607 | 11.2 | 8.9 | 9.7 | 6,616 | 5,521 | 5,910 |
| Spain..... | 154 | 146 | 153 | 10.9 | 10.8 | ----- | 1,675 | 1,584 | ----- |
| Italy..... | 219 | 285 | 296 | 10.1 | 11.1 | 10.7 | 2,222 | 3,154 | 3,155 |
| Germany..... | 1,072 | 1,123 | 1,126 | 11.2 | 10.8 | 9.8 | 11,964 | 12,137 | 11,056 |
| Austria..... | 60 | 70 | 75 | 13.3 | 11.4 | 8.9 | 797 | 800 | 664 |
| Czechoslovakia..... | 712 | 635 | 600 | 12.3 | 10.8 | 10.8 | 8,773 | 6,863 | 6,598 |
| Hungary..... | 159 | 165 | 185 | 10.1 | 9.6 | 8.6 | 1,604 | 1,585 | 1,591 |
| Yugoslavia..... | 102 | 140 | 150 | 6.5 | 7.3 | 7.7 | 660 | 1,024 | 1,154 |
| Rumania..... | 209 | 141 | 122 | 6.6 | 8.2 | 7.3 | 1,383 | 1,163 | 893 |
| Poland..... | 499 | 579 | 591 | 8.0 | 9.3 | ----- | 3,990 | 5,404 | ----- |
| Russia..... | 1,644 | 1,901 | 1,937 | 6.8 | 5.6 | ----- | 11,130 | 10,690 | ----- |
| Other ¹ | 73 | 74 | 69 | 8.1 | 6.2 | 8.5 | 592 | 462 | 586 |
| Total countries reporting for all years..... | 7,045 | 7,286 | 7,421 | ----- | ----- | ----- | 50,939 | 48,964 | 46,779 |
| Estimated world total ² | 7,045 | 7,286 | 7,421 | ----- | ----- | ----- | 67,734 | 66,642 | ----- |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture.

¹ Includes Irish Free State, Switzerland, Bulgaria, Latvia, Finland, and Australia.

² Exclusive of acreage and production in minor producing countries for which no data are available.

TABLE 157.—*Sugar: Production in specified countries, average 1909-1910 to 1913-1914, average 1921-22 to 1925-26, annual 1927-28 to 1929-30*

BEET SUGAR IN TERMS OF RAW SUGAR

| Country | Average 1909-10 to 1913-14 ¹ | Average 1921-22 to 1925-26 | 1927-28 | 1928-29 | 1929-30 prelimi- nary |
|--|---|----------------------------------|-----------------------------|-----------------------------|-----------------------------|
| NORTH AMERICA | | | | | |
| Canada..... | <i>Short tons</i> 11,782 | <i>Short tons</i> 31,908 | <i>Short tons</i> 34,653 | <i>Short tons</i> 36,735 | <i>Short tons</i> 36,000 |
| United States..... | 655,000 | 984,600 | 1,175,000 | 1,141,000 | 1,119,000 |
| Total..... | 666,782 | 1,016,508 | 1,209,653 | 1,177,735 | 1,155,000 |
| EUROPE | | | | | |
| England and Wales..... | ³ 3,064 | 24,385 | 222,271 | 237,389 | } 319,000 |
| Scotland..... | (⁴) | ⁵ 163 | 8,013 | 2,650 | |
| Irish Free State..... | (⁴) | (⁴) | 22,487 | 24,295 | 21,160 |
| Sweden..... | 153,739 | 175,564 | 160,204 | 177,318 | 119,930 |
| Denmark..... | 127,091 | 142,726 | 150,729 | 178,630 | 146,459 |
| Netherlands..... | 246,341 | 324,273 | 320,190 | 343,478 | 277,000 |
| Belgium..... | 278,837 | 346,194 | 296,234 | 303,213 | 276,000 |
| France..... | 807,887 | 609,604 | 936,872 | 982,021 | 990,000 |
| Spain..... | 115,727 | 199,414 | 205,446 | 236,231 | 220,000 |
| Italy..... | 208,675 | 309,343 | 312,311 | 420,478 | 474,000 |
| Switzerland..... | 3,784 | 6,698 | 7,578 | 7,738 | 6,300 |
| Germany..... | ⁶ 2,340,268 | 1,557,556 | 1,846,658 | 2,055,105 | 2,032,366 |
| Austria..... | 79,528 | 53,192 | 121,257 | 118,277 | 130,071 |
| Czechoslovakia..... | 1,221,274 | 1,176,255 | 1,372,197 | 1,161,824 | 1,087,346 |
| Hungary..... | 175,783 | 139,601 | 205,799 | 241,662 | 265,900 |
| Yugoslavia..... | 41,459 | 63,482 | 86,250 | 131,339 | 143,000 |
| Bulgaria..... | 4,376 | 22,041 | 43,266 | 30,071 | 38,580 |
| Rumania..... | ⁷ 88,245 | 76,698 | 158,700 | 133,000 | 86,000 |
| Poland..... | 702,626 | 421,338 | 658,033 | 823,173 | 918,660 |
| Latvia..... | (⁴) | (⁴) | 1,160 | 1,797 | 4,060 |
| Finland..... | (⁴) | 1,407 | 4,818 | 3,315 | 3,300 |
| Russia, European..... | 1,557,114 | 474,700 | 1,473,454 | 1,364,100 | 1,146,000 |
| Total..... | 8,155,838 | 6,124,837 | 8,573,927 | 8,986,104 | 8,705,972 |
| OCEANIA | | | | | |
| Australia..... | ⁸ 1,030 | 3,021 | 2,000 | 2,400 | ----- |
| World total, beet sugar ⁹ | 8,823,650 | 7,144,366 | 9,785,580 | 10,166,239 | 9,862,972 |

CANE SUGAR (RAW)

| | | | | | |
|--|-----------------------|-----------|----------------------|----------------------|----------------------|
| NORTH AND CENTRAL AMERICA AND WEST INDIES | | | | | |
| United States..... | 302,150 | 203,224 | 70,792 | 132,053 | 208,271 |
| Hawaii..... | 567,495 | 675,249 | 896,918 | ² 929,600 | ² 913,000 |
| Porto Rico..... | 361,974 | 499,751 | 748,677 | 586,761 | 743,147 |
| Virgin Islands..... | 5,482 | 5,535 | ² 11,829 | ² 4,500 | ² 7,800 |
| Central America: | | | | | |
| Guatemala..... | 8,968 | 23,733 | ² 32,247 | ² 36,000 | ² 39,000 |
| Nicaragua..... | 3,742 | 14,457 | ² 14,200 | ² 15,000 | ----- |
| Salvador..... | ⁹ 10,834 | 21,500 | ----- | ----- | ----- |
| Mexico..... | 163,388 | 179,150 | ² 196,240 | ² 200,619 | ² 262,000 |
| West Indies (British): | | | | | |
| Antigua..... | 12,919 | 13,267 | ² 22,188 | ² 12,258 | ² 16,800 |
| Barbadoes..... | 27,788 | 51,607 | ² 59,479 | ² 72,632 | ² 65,000 |
| Jamaica..... | 23,850 | 39,883 | ² 70,800 | ² 65,464 | ² 67,000 |
| St. Christopher..... | 13,252 | 13,985 | ² 21,776 | ² 20,000 | ² 18,500 |
| Trinidad and Tobago..... | 51,275 | 66,483 | ² 91,337 | ² 100,717 | ² 95,000 |
| Cuba..... | 2,287,052 | 4,908,638 | 4,526,879 | 5,775,179 | 5,090,944 |
| Dominican Republic..... | ¹⁰ 104,664 | 281,846 | 405,885 | ² 396,575 | ² 421,044 |
| Haiti..... | (¹⁰) | 10,158 | ² 18,331 | ² 18,000 | ² 16,000 |

¹ Figures for Europe are estimates for territory within present boundaries.² Unofficial estimate.³ 2-year average.⁴ No sugar produced.⁵ 1 year only.⁶ 1 year only, 1912-13. According to statistics of the German Sugar Association the 1912-13 sugar production was greater than that of any other year.⁷ 4-year average.⁸ Exclusive of production in minor producing countries for which no data are available.⁹ 3-year average.¹⁰ Too small to report.

TABLE 157.—*Sugar: Production in specified countries, average 1909-1910 to 1913-1914, average 1921-22 to 1925-26, annual 1927-28 to 1929-30—Con.*

CANE SUGAR (RAW)—Continued

| Country | Average 1909-10 to 1913-14 | Average 1921-22 to 1925-26 | 1927-28 | 1928-29 | 1929-30 prelimi- nary |
|---|----------------------------------|----------------------------------|----------------------|------------------------|-----------------------------|
| NORTH AND CENTRAL AMERICA AND WEST INDIES—continued | | | | | |
| West Indies (French): | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> |
| Guadeloupe..... | 40,810 | 32,674 | 37,477 | ² 4,500 | ² 30,000 |
| Martinique..... | 42,782 | 33,573 | ² 13,028 | ² 42,600 | ² 43,000 |
| Total, North and Central American countries and West Indies report- ing, all years..... | 4,013,885 | 7,038,756 | 7,253,883 | 8,397,458 | 7,976,506 |
| EUROPE AND ASIA | | | | | |
| Spain..... | 17,059 | 8,738 | ² 10,000 | 12,787 | ..... |
| India ¹¹ | 2,649,480 | 3,247,800 | 3,602,000 | 3,063,000 | ² 2,968,000 |
| Formosa..... | 192,209 | 473,631 | 620,276 | ² 864,333 | ² 854,000 |
| Japan..... | 75,718 | 98,400 | ² 129,797 | ² 132,720 | ..... |
| Java ¹² | 1,512,569 | 2,113,004 | 2,638,547 | ² 3,240,784 | ² 3,202,457 |
| Philippine Islands..... | 204,380 | 584,895 | 807,814 | (¹) | (¹³) |
| Total, European and Asiatic coun- tries reporting, all years..... | 4,354,348 | 5,834,435 | 6,860,823 | 7,177,117 | 7,024,457 |
| SOUTH AMERICA | | | | | |
| Argentina..... | 193,853 | 288,008 | 456,033 | ² 413,725 | ² 374,158 |
| Brazil..... | ³ 332,813 | 909,079 | ² 727,618 | ² 759,000 | ² 767,000 |
| British Guiana..... | ³ 112,207 | 112,297 | 128,388 | 130,462 | ² 122,356 |
| Dutch Guiana..... | 13,235 | 12,469 | ² 15,120 | ² 17,000 | ² 14,000 |
| Ecuador..... | ³ 6,289 | 17,603 | ² 22,500 | ² 25,370 | ² 25,000 |
| Peru..... | 202,518 | 354,567 | ² 415,211 | ² 405,154 | ² 414,000 |
| Venezuela..... | 3,187 | 21,423 | ² 22,305 | ² 22,000 | ² 25,000 |
| Total, South America..... | 864,192 | 1,715,446 | 1,788,075 | 1,769,711 | 1,741,514 |
| AFRICA | | | | | |
| Egypt..... | 67,127 | 100,264 | ² 100,734 | ² 100,800 | ² 101,000 |
| Mauritius..... | 233,671 | 214,069 | ² 238,500 | ² 277,482 | ² 265,000 |
| Union of South Africa..... | 88,165 | 182,418 | ² 247,273 | ² 290,000 | ² 302,325 |
| Portuguese East Africa..... | 26,460 | 53,219 | ² 79,366 | ² 87,300 | ² 56,000 |
| Reunion..... | 41,653 | 52,015 | ² 55,081 | ² 58,000 | ² 66,000 |
| Madagascar..... | (¹⁰) | 2,168 | ² 3,858 | ² 4,894 | ..... |
| Total, Africa..... | 457,076 | 630,985 | 720,957 | 819,582 | 784,325 |
| OCEANIA | | | | | |
| Australia..... | 216,331 | 411,638 | 578,999 | ² 602,134 | ² 579,040 |
| Fiji..... | 81,629 | 71,084 | ² 106,528 | ² 103,000 | ² 95,000 |
| Total, Oceania..... | 300,960 | 483,622 | 685,527 | 705,134 | 674,040 |
| Total cane-sugar producing countries reporting, all years..... | 9,990,461 | 15,793,244 | 17,309,265 | 18,869,002 | 18,200,842 |
| Estimated world total cane-sugar ⁸ | 10,539,000 | 16,622,000 | 18,481,000 | 20,058,000 | 19,406,000 |
| Total world cane and beet sugar production in countries reporting, all years..... | 18,814,111 | 22,847,610 | 27,094,845 | 29,035,241 | 28,063,814 |
| Estimated world total, cane and beet sugar ⁸ | 19,363,000 | 23,766,000 | 28,267,000 | 30,224,000 | 29,260,000 |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Figures are for the crop years 1909-10 to 1929-30 for the countries in which the sugar-harvesting season begins in the fall months and is completed during the following calendar year, except in certain cane-sugar producing countries where the season begins in May or June and is completed in the same calendar year. Production in these countries is for the calendar years 1909 to 1929.

¹ Unofficial estimate.

² 2-year average.

³ Exclusive of production in minor producing countries for which no data are available.

⁴ 3-year average.

⁵ Too small to report.

¹¹ The figures quoted for India are for the production of gur, a low grade of sugar polarizing between 50° and 60°. This sugar is mostly consumed by the natives.

¹² All grades of sugar reduced to terms of head sugar, a grade of sugar which contains at least 96.5 per cent of sucrose.

¹³ Figures for the total crop are not yet available. Trade reports place the 1928-29 commercial crop at 830,000 short tons and that of 1929-30 at 840,000 short tons.

TABLE 158.—*Sugar: Production, trade, and supply available for consumption in continental United States, 1909-1929*

IN TERMS OF RAW SUGAR

| Year beginning July 1 | Production ¹ | Brought in from insular possessions ² | Imports as sugar ³ | Domestic exports as sugar ⁴ | Exports in other forms ⁵ | Available for consump- tion ⁶ | |
|--------------------------|-------------------------|--|----------------------------------|--|--|---|---------------|
| | | | | | | Total | Per capita |
| | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Pounds</i> |
| 1909 | 882,630 | 927,752 | 1,934,754 | 72,382 | 24,351 | 3,648,403 | 79.7 |
| 1910 | 903,475 | 943,701 | 1,845,279 | 36,597 | 15,966 | 3,639,891 | 78.3 |
| 1911 | 1,005,337 | 1,187,663 | 1,832,424 | 50,380 | 15,160 | 3,959,883 | 83.9 |
| 1912 | 907,070 | 1,026,972 | 2,266,426 | 30,963 | 19,217 | 4,150,288 | 86.6 |
| 1913 | 1,088,944 | 936,376 | 2,463,252 | 37,190 | 11,892 | 4,439,489 | 91.3 |
| 1914 | 1,022,828 | 1,098,314 | 2,529,963 | 302,641 | 13,585 | 4,334,878 | 87.9 |
| 1915 | 1,078,407 | 1,102,057 | 2,689,067 | 882,864 | 12,213 | 3,974,453 | 79.4 |
| 1916 | 1,193,107 | 1,203,938 | 2,527,984 | 676,752 | 29,211 | 4,219,066 | 83.2 |
| 1917 | 1,068,437 | 975,684 | 2,344,816 | 305,429 | 46,131 | 4,037,377 | 78.5 |
| 1918 | 1,102,421 | 1,073,944 | 2,799,962 | 568,566 | 36,747 | 4,371,013 | 83.8 |
| 1919 | 903,060 | 975,735 | 3,812,955 | 776,502 | 98,386 | 4,816,862 | 91.1 |
| 1920 | 1,346,811 | 1,076,342 | 3,228,279 | 319,589 | 89,491 | 5,242,852 | 97.6 |
| 1921 | 1,424,726 | 1,340,807 | 3,940,777 | 1,085,349 | 31,397 | 5,589,624 | 102.4 |
| 1922 | 1,021,360 | 1,235,040 | 4,068,205 | 412,196 | 12,568 | 5,899,849 | 106.5 |
| 1923 | 1,111,898 | 1,274,870 | 3,436,955 | 152,883 | 24,617 | 5,646,223 | 100.2 |
| 1924 | 1,260,000 | 1,615,319 | 3,931,282 | 273,470 | 22,436 | 6,540,695 | 114.2 |
| 1925 | 1,121,000 | 1,981,492 | 3,895,947 | 325,804 | 24,998 | 6,647,627 | 114.4 |
| 1926 | 1,011,000 | 1,689,347 | 3,968,880 | 124,555 | 26,303 | 6,518,186 | 110.6 |
| 1927 | 1,246,000 | 2,051,659 | 3,415,830 | 115,566 | 29,833 | 6,568,090 | 110.1 |
| 1928 | 1,273,000 | 1,974,809 | 4,115,601 | 139,321 | 31,894 | 7,192,282 | 119.2 |
| 1929 | 1,327,000 | | | | | | |

IN TERMS OF REFINED SUGAR⁷

| 1921 | 1,325,906 | 1,260,891 | 3,686,397 | 1,000,377 | 29,182 | 5,231,638 | 95.9 |
|------|-----------|-----------|-----------|-----------|--------|-----------|-------|
| 1922 | 950,625 | 1,161,351 | 3,805,745 | 383,439 | 11,682 | 5,522,000 | 99.7 |
| 1923 | 1,034,615 | 1,198,777 | 3,214,883 | 112,217 | 22,913 | 5,283,115 | 93.7 |
| 1924 | 1,172,000 | 1,547,587 | 3,674,563 | 254,391 | 20,911 | 6,118,848 | 106.8 |
| 1925 | 1,043,000 | 1,859,332 | 3,631,323 | 303,073 | 23,298 | 6,210,284 | 106.8 |
| 1926 | 941,000 | 1,588,981 | 3,714,054 | 115,865 | 24,514 | 6,103,650 | 103.6 |
| 1927 | 1,159,000 | 1,930,732 | 3,196,443 | 107,704 | 27,805 | 6,150,666 | 103.1 |
| 1928 | 1,184,000 | 1,858,331 | 3,851,311 | 129,846 | 29,726 | 6,734,070 | 111.6 |
| 1929 | 1,235,000 | | | | | | |

Bureau of Agricultural Economics. Trade figures compiled from Commerce and Navigation of the United States, 1909-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1926, January and June issues, 1927-29, and official records of the Bureau of Foreign and Domestic Commerce.

¹ Beet and cane sugar only.

² Duty free, from Hawaii, Porto Rico, the Philippine Islands, and from the Virgin Islands since 1916.

³ No account taken of sugar imported in other forms. Imports from the Philippine Islands excluded, reexports deducted.

⁴ Shipments to Hawaii and Porto Rico included. Direct exports to foreign countries from Hawaii and Porto Rico excluded.

⁵ Sugar used in the manufacture of other commodities for export on which drawback was paid.

⁶ No account taken of stocks at the beginning or end of year.

⁷ Not available.

⁸ Raw sugar converted to refined by multiplying by the following factors: Cuba and Hawaii, 0.9358; Porto Rico, 0.9393; Philippines, 0.95; all others (Santo Domingo, British West Indies, Louisiana, etc.), 0.932.

TABLE 159.—*Sugar: International trade, average 1909-1913, annual 1926-1928*

| Average | Year ended Dec. 31 | | | | | | | |
|--------------------------------------|--------------------|----------------------|---------------------|----------------------|---------------------|----------------------|-------------------|-------------------|
| | Average 1909-1913 | | 1926 | | 1927 | | 1928, preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> |
| Cuba..... | 656 | 1,991,912 | 595 | 5,227,219 | 324 | 4,645,002 | | |
| Dutch East Indies..... | 3,606 | 1,409,616 | 3,372 | 1,914,463 | 3,000 | 2,202,130 | 1,211 | 12,827,249 |
| Czechoslovakia..... | 0 | 0 | 68 | 1,019,467 | 2,832 | 615,583 | 77 | 819,546 |
| Philippine Islands..... | 3,950 | 179,432 | 1,352 | 453,301 | 2,509 | 609,929 | 4,887 | 628,242 |
| Netherlands..... | 82,721 | 200,490 | 433,744 | 347,451 | 293,131 | 307,733 | 307,109 | 227,232 |
| Peru..... | 726 | 146,736 | 22 | 364,921 | 27 | 331,166 | 24 | 337,270 |
| Dominican Republic..... | ² 766 | 92,351 | 191 | 372,195 | 189 | 326,166 | 17 | 594,470 |
| Mauritius..... | ³ 2 | 226,255 | 1 | 199,754 | ⁴ 3 | ⁴ 251,313 | | |
| Poland..... | 0 | 0 | 61 | 293,973 | 64 | 222,966 | 38 | 204,675 |
| Belgium..... | 7,892 | 154,476 | 56,494 | 176,594 | 90,881 | 116,251 | 86,338 | 100,902 |
| Germany..... | 3,486 | 873,161 | 47,668 | 254,125 | 121,983 | 164,174 | 124,166 | 83,803 |
| British Guiana..... | ³ 6,112 | 100,196 | 446 | 94,856 | 455 | 122,770 | 536 | 128,449 |
| Australia..... | 76,233 | 268 | ⁴ 4,069 | ⁴ 129,708 | ⁴ 32 | ⁴ 143,334 | | |
| Hungary..... | ⁴ 3,942 | ⁴ 848,830 | 138 | 72,986 | 327 | 74,045 | 609 | 78,875 |
| Fiji..... | ⁴ 386 | 78,817 | 136 | 63,830 | 134 | 81,483 | | |
| Trinidad and Tobago..... | 522 | 43,755 | 1,408 | 73,560 | 1,618 | 46,822 | | |
| Reunion..... | ⁴ 2 | 41,658 | ⁴ 0 | ⁴ 69,790 | ⁴ 0 | ⁴ 69,183 | | |
| Jamaica..... | 395 | 14,494 | ⁴ 750 | ⁴ 53,933 | ⁴ 1,120 | ⁴ 55,774 | | |
| Union of South Africa..... | 20,694 | 675 | 4,654 | 65,289 | 3,061 | 60,164 | 17,958 | 84,154 |
| Formosa..... | 554 | 5,744 | ⁴ 31,924 | ⁴ 14,362 | ⁴ 25,083 | ⁴ 13,199 | | |
| Russia..... | 3,744 | 293,514 | ⁴ 2,764 | ⁴ 82,788 | ⁴ 8,689 | ⁴ 121,173 | | |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | |
| United States..... | 2,122,517 | 39,684 | 4,710,099 | 106,893 | 4,215,773 | 125,323 | 3,858,804 | 122,587 |
| United Kingdom..... | 1,853,605 | 32,003 | 1,972,516 | 86,979 | 1,892,705 | 94,915 | 2,151,712 | 83,707 |
| British India..... | 715,990 | 26,611 | 875,927 | 41,993 | 840,224 | 43,374 | 930,251 | 44,674 |
| China..... | 343,622 | 14,933 | 777,000 | 819 | 668,240 | 2,544 | | |
| Canada..... | 297,893 | 820 | 580,234 | 144,938 | 494,397 | 101,116 | 477,711 | 27,555 |
| France..... | 186,198 | 206,897 | 486,188 | 214,110 | 392,317 | 234,988 | 485,631 | 283,820 |
| Japan..... | 176,942 | 60,204 | 504,588 | 204,206 | 468,188 | 179,300 | 420,051 | 339,508 |
| Switzerland..... | 118,201 | 0 | 142,015 | 66 | 137,422 | 57 | 158,532 | 85 |
| British Malaya..... | | | 121,969 | 32,070 | 124,038 | 26,653 | 125,173 | 31,352 |
| Austria..... | 0 | 0 | 114,124 | 636 | 108,132 | 370 | | |
| Chile..... | 84,965 | 90 | 135,962 | ⁴ 88 | 105,175 | | 141,437 | |
| Irish Free State..... | 0 | 0 | 101,855 | 0 | 81,506 | 0 | 90,115 | 0 |
| Morocco..... | 61,402 | 0 | 109,088 | 0 | 113,008 | 0 | | |
| Finland..... | 50,077 | 0 | 37,409 | 0 | 73,489 | 0 | 101,485 | 0 |
| New Zealand..... | 62,962 | ³ 13,478 | 88,999 | 713 | 70,122 | 641 | 89,497 | 867 |
| Norway..... | 52,326 | 0 | 81,797 | 0 | 78,839 | 0 | 80,089 | 0 |
| Persia ?..... | 109,352 | ³ 567 | 77,613 | 117 | 79,754 | 8 | | |
| Portugal..... | 39,631 | 0 | ⁴ 85,488 | ⁴ 85 | | | | |
| Italy..... | 9,249 | 302 | 22,798 | 8,058 | 77,291 | 5,073 | 118,495 | 4 |
| Denmark..... | 21,814 | 22,536 | 22,482 | 1,100 | 12,632 | 11,920 | 44,896 | 606 |
| Greece..... | 11,718 | 0 | 53,065 | 0 | 66,460 | 0 | 67,072 | 0 |
| Sweden..... | 1,672 | 1 | 117,078 | 4 | 124,868 | 13 | 103,528 | 18 |
| Egypt..... | 43,020 | 8,086 | 61,973 | ⁴ 670 | 57,119 | 6,367 | 77,881 | 5,704 |
| Algeria..... | 37,908 | 0 | 53,578 | 145 | 62,316 | ⁴ 88 | 70,785 | |
| Argentina..... | 51,690 | 72 | 1,498 | 162 | 853 | 69,045 | | |
| Anglo-Egyptian Sudan..... | 13,704 | 0 | 24,625 | 0 | 19,570 | 0 | 26,784 | 0 |
| Total 47 countries..... | 6,691,907 | 7,135,254 | 11,949,885 | 12,196,417 | 10,919,900 | 11,482,155 | 10,161,899 | 7,063,854 |

Bureau of Agricultural Economics. Official sources except where otherwise noted.

The following kinds and grades have been included under the head of sugar: Brown, white, candied, caramel, chancaca (Peru), crystal cube, maple, muscovado, panela. The following have been excluded: "Candy" (meaning confectionery), confectionery, glucose, grape sugar, jaggery, molasses, and sirupa

¹ Java and Madura only.² One year only.³ Four-year average.⁴ International Yearbook of Agricultural Statistics.⁵ Average for Austria-Hungary.⁶ Three-year average.⁷ Year ended Mar. 20.

TABLE 160.—*Sugar, raw; cane, and beet: World production, 1909-10 to 1929-30*

| Year ¹ | Esti- mated world total | Esti- mated world total cane sugar | Esti- mated world total beet sugar | Chief producing countries | | | | | |
|----------------------------|----------------------------------|---|---|-------------------------------|------------------------|------------------------|------------------------|---------------------------|------------------------|
| | | | | United States ² | Cuba | India ³ | Java ⁴ | Ger- many ⁵ | Czecho- slovakia |
| | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons |
| 1909-10..... | 16,828 | 9,670 | 7,158 | 883 | 2,021 | 2,481 | 1,369 | 2,147 | ----- |
| 1910-11..... | 18,834 | 9,870 | 8,964 | 903 | 1,681 | 2,587 | 1,411 | 2,770 | ----- |
| 1911-12..... | 17,908 | 10,622 | 7,286 | 1,005 | 2,124 | 2,745 | 1,617 | 1,552 | ----- |
| 1912-13..... | 20,542 | 10,896 | 9,646 | 907 | 2,720 | 2,862 | 1,550 | 2,902 | ----- |
| 1913-14..... | 21,154 | 11,640 | 9,514 | 1,089 | 2,909 | 2,573 | 1,616 | 2,886 | ----- |
| 1914-15..... | 20,875 | 11,952 | 8,923 | 1,023 | 2,922 | 2,736 | 1,549 | 2,721 | ----- |
| 1915-16..... | 18,885 | 12,278 | 6,607 | 1,078 | 3,398 | 2,949 | 1,454 | 1,678 | ----- |
| 1916-17..... | 18,592 | 13,255 | 5,337 | 1,193 | 3,422 | 3,095 | 1,797 | 1,721 | ----- |
| 1917-18..... | 20,293 | 14,790 | 5,503 | 1,068 | 3,800 | 3,838 | 2,000 | 1,726 | ----- |
| 1918-19..... | 18,791 | 14,076 | 4,715 | 1,102 | 4,491 | 2,753 | 1,960 | 1,297 | ⁶ 714 |
| 1919-20..... | 17,908 | 14,337 | 3,661 | 903 | 4,184 | 3,404 | 1,473 | 774 | 553 |
| 1920-21..... | 19,563 | 14,225 | 5,338 | 1,347 | 4,406 | 2,825 | 1,681 | 1,195 | 797 |
| 1921-22..... | 20,577 | 15,100 | 5,477 | 1,425 | 4,517 | 2,928 | 1,853 | 1,434 | 731 |
| 1922-23..... | 20,855 | 15,129 | 5,726 | 1,021 | 4,083 | 3,410 | 1,994 | 1,604 | 811 |
| 1923-24..... | 22,808 | 16,319 | 6,480 | 1,112 | 4,606 | 3,715 | 1,981 | 1,263 | 1,115 |
| 1924-25..... | 26,636 | 17,729 | 8,907 | 1,260 | 5,812 | 2,852 | 2,201 | 1,724 | 1,574 |
| 1925-26..... | 27,951 | 18,829 | 9,122 | 1,121 | 5,524 | 3,334 | 2,535 | 1,763 | 1,650 |
| 1926-27..... | 26,541 | 18,093 | 8,448 | 1,011 | 5,050 | 3,659 | 2,175 | 1,834 | 1,153 |
| 1927-28..... | 28,267 | 18,481 | 9,786 | 1,246 | 4,527 | 3,602 | 2,639 | 1,847 | 1,372 |
| 1928-29..... | 30,224 | 20,058 | 10,166 | 1,273 | 5,775 | 3,063 | ⁷ 3,250 | 2,055 | 1,162 |
| 1929-30 (preliminary)..... | 29,269 | 19,406 | 9,863 | 1,327 | 5,091 | 2,968 | ⁷ 3,202 | ⁷ 2,032 | ⁷ 1,067 |

Bureau of Agricultural Economics. Estimated world total sugar production for the period 1895-96 to 1908-09 in *Agricultural Yearbook*, 1924, p. 808.

¹ Figures are for the crop years 1909-10 to 1929-30 for the countries in which the sugar production season begins in the fall months and is completed during the following calendar year except in the cane-sugar producing countries where the season begins in May or June and is completed in the same calendar year. Production in these countries is for the calendar years 1909 to 1929.

² Production of cane and beet sugar in terms of raw sugar.

³ The figures quoted are the production of gur, a low grade of sugar polarizing between 50° and 60°.

⁴ All grades of sugar reduced to terms of head sugar, a grade of sugar which contains at least 96.5 per cent sucrose.

⁵ Figures for 1909-10 to 1917-18 are for pre-war boundaries.

⁶ Bohemia, Moravia, and Silesia only.

⁷ Unofficial estimate.

TABLE 161.—*Sugar, raw (96° centrifugal): Average wholesale price per pound New York, 1909-1929 ¹*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average ² |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1909..... | 3.7 | 3.6 | 3.8 | 3.9 | 3.9 | 3.9 | 3.9 | 4.1 | 4.2 | 4.3 | 4.4 | 4.2 | 4.0 |
| 1910..... | 4.1 | 4.2 | 4.4 | 4.3 | 4.3 | 4.2 | 4.3 | 4.4 | 4.3 | 3.9 | 3.9 | 4.0 | 4.2 |
| 1911..... | 3.6 | 3.5 | 3.8 | 3.9 | 3.9 | 3.9 | 4.3 | 4.9 | 5.9 | 5.9 | 5.1 | 4.8 | 4.5 |
| 1912..... | 4.4 | 4.6 | 4.5 | 4.1 | 4.0 | 3.9 | 3.9 | 4.1 | 4.3 | 4.1 | 4.0 | 4.0 | 4.2 |
| 1913..... | 3.5 | 3.5 | 3.5 | 3.4 | 3.3 | 3.3 | 3.6 | 3.7 | 3.7 | 3.5 | 3.6 | 3.4 | 3.5 |
| 1914..... | 3.3 | 3.4 | 8.0 | 3.0 | 3.2 | 3.3 | 3.3 | 5.7 | 5.8 | 4.4 | 3.9 | 3.9 | 3.8 |
| 1915..... | 4.1 | 4.7 | 4.8 | 4.8 | 4.8 | 4.9 | 4.9 | 4.8 | 4.3 | 4.1 | 4.8 | 4.9 | 4.7 |
| 1916..... | 4.6 | 4.9 | 5.6 | 6.2 | 6.4 | 6.3 | 6.3 | 5.6 | 5.6 | 6.3 | 6.2 | 5.3 | 5.8 |
| 1917..... | 5.2 | 5.2 | 5.5 | 6.2 | 6.1 | 6.0 | 6.6 | 7.3 | 7.0 | 6.9 | 6.9 | 6.3 | 6.3 |
| 1918..... | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.1 | 6.1 | 7.0 | 7.3 | 7.3 | 7.3 | 6.4 |
| 1919..... | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 10.2 | 7.5 |
| 1920..... | 13.0 | 11.4 | 11.9 | 17.7 | 20.8 | 19.7 | 17.6 | 13.4 | 10.7 | 8.3 | 6.8 | 5.3 | 13.0 |
| 1921..... | 5.4 | 5.3 | 6.1 | 5.4 | 4.9 | 4.2 | 4.4 | 4.7 | 4.3 | 4.2 | 4.1 | 3.7 | 4.7 |
| 1922..... | 3.6 | 3.8 | 3.9 | 4.0 | 4.1 | 4.6 | 5.2 | 5.2 | 4.8 | 5.4 | 5.6 | 5.7 | 4.7 |
| 1923..... | 5.3 | 6.2 | 7.3 | 7.8 | 7.9 | 7.4 | 6.9 | 6.1 | 7.0 | 7.6 | 7.3 | 7.3 | 7.0 |
| 1924..... | 6.7 | 7.2 | 6.9 | 6.4 | 5.6 | 5.1 | 5.1 | 5.4 | 6.0 | 6.0 | 5.8 | 5.8 | 6.0 |
| 1925..... | 4.6 | 4.6 | 4.7 | 4.5 | 4.3 | 4.4 | 4.3 | 4.4 | 4.3 | 3.9 | 4.0 | 4.1 | 4.3 |
| 1926..... | 4.2 | 4.2 | 4.0 | 4.1 | 4.2 | 4.1 | 4.2 | 4.2 | 4.4 | 4.6 | 4.7 | 5.1 | 4.3 |
| 1927..... | 5.1 | 4.9 | 4.8 | 4.8 | 4.8 | 4.6 | 4.5 | 4.5 | 4.8 | 4.7 | 4.7 | 4.6 | 4.7 |
| 1928..... | 4.5 | 4.3 | 4.5 | 4.5 | 4.5 | 4.3 | 4.2 | 4.1 | 4.2 | 3.9 | 3.9 | 3.9 | 4.2 |
| 1929..... | 3.8 | 3.7 | 3.7 | 3.7 | 3.6 | 3.5 | 3.8 | 3.8 | 4.0 | 4.0 | 3.8 | 3.8 | 3.8 |

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports. Data for 1890-1908 are available in 1924 *Yearbook*, p. 810, Table 388.

¹ Quotations are on basis of duty paid.

² Derived from the figures upon which the monthly averages are based.

TABLE 162.—*Sugar, granulated: Average retail price per pound, United States 1913-1929*

| Year | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Aver- age |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1913..... | 5.8 | 5.5 | 5.4 | 5.4 | 5.4 | 5.3 | 5.5 | 5.6 | 5.7 | 5.5 | 5.4 | 5.4 | 5.5 |
| 1914..... | 5.2 | 5.2 | 5.1 | 5.0 | 5.0 | 5.1 | 5.2 | 7.9 | 8.0 | 7.2 | 6.2 | 6.1 | 5.9 |
| 1915..... | 6.0 | 6.5 | 6.6 | 6.7 | 6.8 | 6.9 | 7.0 | 6.7 | 6.5 | 6.1 | 6.6 | 6.8 | 6.6 |
| 1916..... | 6.7 | 6.9 | 7.5 | 8.0 | 8.6 | 8.7 | 8.8 | 8.5 | 7.7 | 8.2 | 8.6 | 8.3 | 8.0 |
| 1917..... | 8.0 | 8.1 | 8.8 | 9.6 | 10.1 | 9.4 | 9.2 | 10.0 | 9.9 | 9.8 | 9.6 | 9.5 | 9.3 |
| 1918..... | 9.5 | 10.6 | 9.2 | 9.1 | 9.1 | 9.1 | 9.2 | 9.3 | 9.6 | 10.6 | 10.8 | 10.8 | 9.7 |
| 1919..... | 10.8 | 10.7 | 10.6 | 10.6 | 10.6 | 10.6 | 10.9 | 11.1 | 11.0 | 11.4 | 12.5 | 14.5 | 11.3 |
| 1920..... | 17.8 | 18.8 | 18.7 | 20.2 | 25.4 | 26.7 | 26.5 | 22.9 | 18.3 | 13.9 | 12.8 | 10.5 | 19.4 |
| 1921..... | 9.7 | 8.9 | 9.7 | 9.7 | 8.4 | 7.8 | 7.1 | 7.5 | 7.3 | 6.9 | 6.7 | 6.5 | 8.0 |
| 1922..... | 6.2 | 6.4 | 6.5 | 6.7 | 6.6 | 7.1 | 7.6 | 8.1 | 7.9 | 7.9 | 8.1 | 8.3 | 7.3 |
| 1923..... | 8.3 | 8.7 | 10.2 | 10.6 | 11.2 | 11.1 | 10.5 | 9.6 | 9.6 | 10.6 | 10.3 | 10.4 | 10.1 |
| 1924..... | 10.2 | 10.3 | 10.4 | 9.9 | 9.2 | 8.3 | 8.4 | 8.2 | 8.6 | 8.8 | 8.8 | 8.8 | 9.2 |
| 1925..... | 8.1 | 7.7 | 7.7 | 7.5 | 7.2 | 7.2 | 7.1 | 7.0 | 7.0 | 6.8 | 6.6 | 6.7 | 7.2 |
| 1926..... | 6.7 | 6.7 | 6.7 | 6.6 | 6.7 | 6.9 | 6.9 | 7.0 | 7.0 | 7.1 | 7.1 | 7.3 | 6.9 |
| 1927..... | 7.5 | 7.5 | 7.4 | 7.3 | 7.3 | 7.3 | 7.4 | 7.3 | 7.2 | 7.2 | 7.2 | 7.1 | 7.3 |
| 1928..... | 7.1 | 7.1 | 7.1 | 7.1 | 7.2 | 7.3 | 7.3 | 7.1 | 7.0 | 6.9 | 6.8 | 6.7 | 7.1 |
| 1929..... | 6.7 | 6.6 | 6.5 | 6.4 | 6.4 | 6.4 | 6.4 | 6.6 | 6.7 | 6.7 | 6.7 | 6.6 | 6.6 |

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics retail prices.

TABLE 163.—*Sorgo sirup: Acreage, production, and December 1 price, by States, 1926-1929*

| State | Acreage | | | | Average yield per acre | | | | Production | | | | Price per gallon received by producers Dec. 1 | | | |
|---------------------|------------------------|------------------------|------------------------|------------------------|---------------------------|--------------|--------------|--------------|------------------------|------------------------|------------------------|------------------------|---|-------------|-------------|-------------|
| | 1926 | 1927 | 1928 | 1929 ¹ | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 ¹ | 1926 | 1927 | 1928 | 1929 |
| | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>Gals.</i> | <i>Gals.</i> | <i>Gals.</i> | <i>Gals.</i> | <i>1,000 gals.</i> | <i>1,000 gals.</i> | <i>1,000 gals.</i> | <i>1,000 gals.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| Ohio..... | 4 | 4 | 4 | 3 | 72 | 76 | 72 | 85 | 288 | 304 | 288 | 255 | 120 | 115 | 125 | 120 |
| Indiana..... | 2 | 2 | 2 | 2 | 92 | 80 | 96 | 90 | 184 | 160 | 192 | 180 | 105 | 110 | 115 | 110 |
| Illinois..... | 12 | 10 | 9 | 9 | 78 | 65 | 72 | 70 | 936 | 650 | 648 | 630 | 105 | 110 | 110 | 110 |
| Wisconsin..... | 2 | 2 | 2 | 2 | 66 | 55 | 64 | 70 | 132 | 110 | 128 | 140 | 140 | 135 | 140 | 140 |
| Minnesota..... | 2 | 2 | 2 | 2 | 80 | 70 | 84 | 80 | 160 | 140 | 168 | 160 | 120 | 110 | 120 | 120 |
| Iowa..... | 6 | 2 | 3 | 3 | 77 | 70 | 120 | 130 | 462 | 140 | 360 | 390 | 110 | 115 | 115 | 115 |
| Missouri..... | 25 | 22 | 22 | 21 | 78 | 79 | 85 | 75 | 1,950 | 1,738 | 1,870 | 1,575 | 100 | 100 | 100 | 105 |
| Nebraska..... | 2 | 2 | 2 | 2 | 64 | 80 | 83 | 90 | 128 | 160 | 166 | 180 | 100 | 105 | 105 | 100 |
| Kansas..... | 3 | 2 | 2 | 2 | 58 | 65 | 75 | 75 | 174 | 130 | 150 | 150 | 95 | 100 | 100 | 95 |
| Virginia..... | 12 | 10 | 12 | 10 | 100 | 92 | 86 | 81 | 1,200 | 920 | 1,032 | 810 | 95 | 95 | 95 | 95 |
| West Virginia..... | 8 | 6 | 7 | 7 | 97 | 89 | 88 | 90 | 776 | 534 | 616 | 630 | 110 | 110 | 110 | 110 |
| North Carolina..... | 30 | 22 | 20 | 20 | 91 | 92 | 86 | 94 | 2,730 | 2,024 | 1,720 | 1,880 | 90 | 90 | 90 | 85 |
| South Carolina..... | 22 | 26 | 18 | 19 | 77 | 71 | 72 | 68 | 1,694 | 1,846 | 1,296 | 1,292 | 75 | 75 | 80 | 80 |
| Georgia..... | 23 | 25 | 24 | 26 | 90 | 82 | 80 | 75 | 2,070 | 2,050 | 1,920 | 1,950 | 70 | 75 | 90 | 90 |
| Kentucky..... | 51 | 38 | 42 | 42 | 95 | 81 | 72 | 78 | 4,845 | 3,078 | 3,024 | 3,276 | 80 | 85 | 95 | 100 |
| Tennessee..... | 32 | 29 | 29 | 30 | 93 | 86 | 78 | 86 | 2,976 | 2,494 | 2,262 | 2,580 | 80 | 85 | 95 | 95 |
| Alabama..... | 36 | 35 | 30 | 28 | 100 | 82 | 75 | 70 | 3,600 | 2,870 | 2,250 | 1,960 | 80 | 80 | 90 | 85 |
| Mississippi..... | 27 | 30 | 30 | 32 | 100 | 85 | 80 | 87 | 2,700 | 2,550 | 2,400 | 2,784 | 70 | 70 | 80 | 75 |
| Arkansas..... | 38 | 44 | 40 | 41 | 77 | 80 | 70 | 57 | 2,926 | 3,520 | 2,800 | 2,337 | 85 | 85 | 90 | 95 |
| Louisiana..... | 1 | 1 | 1 | 1 | 135 | 110 | 80 | 89 | 135 | 110 | 80 | 89 | 70 | 75 | 75 | 70 |
| Oklahoma..... | 14 | 17 | 15 | 14 | 83 | 85 | 70 | 55 | 1,162 | 1,445 | 1,050 | 770 | 85 | 85 | 85 | 85 |
| Texas..... | 34 | 34 | 32 | 29 | 95 | 95 | 83 | 72 | 3,230 | 3,230 | 2,088 | 80 | 80 | 80 | 80 | 85 |
| New Mexico..... | 1 | 1 | 1 | 1 | 80 | 66 | 76 | 75 | 80 | 65 | 76 | 75 | 100 | 105 | 95 | 100 |
| United States..... | 387 | 366 | 349 | 346 | 89.2 | 82.7 | 77.8 | 75.7 | 34,538 | 30,268 | 27,152 | 26,181 | 84.2 | 85.0 | 91.7 | 92.2 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.

TABLE 164.—*Sugar cane sirup: Acreage, production, and December 1 price, by States, 1926-1929*

| State | Acreage used for sirup | | | | Average yield per acre | | | | Production | | | | Price per gallon received by producers Dec. 1 | | | |
|----------------|------------------------|-------------|-------------|-------------------|------------------------|-------|-------|-------|-------------|-------------|-------------|-------------------|---|------|------|------|
| | 1926 | 1927 | 1928 | 1929 ¹ | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 ¹ | 1926 | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | Gals. | Gals. | Gals. | Gals. | 1,000 gals. | 1,000 gals. | 1,000 gals. | 1,000 gals. | Cts. | Cts. | Cts. | Cts. |
| South Carolina | 5 | 7 | 6 | 6 | 140 | 140 | 125 | 150 | 700 | 980 | 750 | 900 | 90 | 90 | 90 | 90 |
| Georgia | 35 | 34 | 29 | 33 | 175 | 150 | 140 | 160 | 6,125 | 5,100 | 4,060 | 5,280 | 75 | 75 | 75 | 75 |
| Florida | 10 | 9 | 8 | 9 | 210 | 183 | 180 | 190 | 2,100 | 1,647 | 1,440 | 1,710 | 85 | 85 | 85 | 85 |
| Alabama | 20 | 18 | 16 | 17 | 165 | 135 | 117 | 125 | 3,300 | 2,430 | 1,372 | 2,125 | 90 | 95 | 95 | 90 |
| Mississippi | 14 | 17 | 18 | 22 | 205 | 215 | 200 | 230 | 2,870 | 3,655 | 3,600 | 5,000 | 95 | 95 | 90 | 85 |
| Arkansas | 3 | 2 | 2 | 2 | 135 | 100 | 120 | 105 | 405 | 200 | 240 | 210 | 105 | 110 | 110 | 110 |
| Louisiana | 34 | 15 | 20 | 24 | 133 | 309 | 334 | 303 | 4,516 | 4,787 | 6,679 | 7,117 | 60 | 55 | 55 | 55 |
| Texas | 11 | 12 | 11 | 11 | 196 | 170 | 160 | 96 | 2,156 | 2,040 | 1,760 | 1,056 | 95 | 110 | 110 | 105 |
| United States | 132 | 114 | 110 | 124 | 168.0 | 182.8 | 185.5 | 189.2 | 22,172 | 20,839 | 20,401 | 23,438 | 80.7 | 81.5 | 77.6 | 75.4 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.TABLE 165.—*Maple sugar and sirup: Production in 10 important States, 1917-1929¹*

| Year | Trees tapped | Sugar made | Sirup made | Total product in terms of sugar ² | Average total product per tree | | Average price received by producers | |
|------|--------------|--------------|---------------|--|--------------------------------|-----------------------|-------------------------------------|---------------------|
| | | | | | As sugar ² | As sirup ² | Per pound of sugar | Per gallon of sirup |
| | Thousand | 1,000 pounds | 1,000 gallons | 1,000 pounds | Pounds | Gallons | Cents | Dollars |
| 1917 | 17,313 | 10,525 | 4,258 | 44,589 | 2.58 | 0.32 | | |
| 1918 | 19,132 | 12,944 | 4,863 | 51,848 | 2.71 | .34 | | |
| 1919 | 18,799 | 9,787 | 3,804 | 40,219 | 2.14 | .27 | | |
| 1920 | 18,895 | 7,324 | 3,580 | 35,964 | 1.90 | .24 | | |
| 1921 | 15,114 | 4,730 | 2,386 | 23,818 | 1.58 | .20 | | |
| 1922 | 16,274 | 5,147 | 3,640 | 34,267 | 2.11 | .26 | | |
| 1923 | 15,291 | 4,685 | 3,605 | 33,525 | 2.19 | .27 | | |
| 1924 | 15,407 | 4,078 | 3,903 | 35,302 | 2.29 | .29 | .26 | 2.02 |
| 1925 | 15,313 | 3,236 | 3,089 | 27,946 | 1.82 | .23 | .27 | 2.10 |
| 1926 | 14,712 | 3,569 | 3,737 | 33,465 | 2.27 | .28 | .29 | 2.16 |
| 1927 | 14,603 | 3,133 | 3,671 | 32,501 | 2.23 | .28 | .29 | 2.00 |
| 1928 | 14,388 | 2,317 | 3,007 | 26,373 | 1.83 | .23 | .29 | 2.05 |
| 1929 | 14,130 | 1,706 | 2,595 | 22,469 | 1.50 | .20 | .30 | 2.07 |

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¹ The data from 1917-1923 include 11 States: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, Pennsylvania, Ohio, Indiana, Michigan, and Wisconsin; data for 10 States, excluding Connecticut, are shown for 1924 and 1925; 9 States, excluding Indiana, for which data are shown from 1926-1929, produced about 97 per cent of the maple sugar and about 92 per cent of the maple sirup in the United States in 1919 as reported by the Bureau of the Census.

² 1 gallon of sirup taken as equivalent to 8 pounds of sugar.

TABLE 166.—*Maple sugar and sirup: Production, by States, 1926-1929*

| State | Trees tapped | | | | Sugar made | | | | Sirup made | | | |
|-----------------------------|--------------|----------|----------|----------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | Thousand | Thousand | Thousand | Thousand | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 gals. | 1,000 gals. | 1,000 gals. | 1,000 gals. |
| Maine | 304 | 310 | 304 | 307 | 29 | 15 | 3 | 14 | 61 | 60 | 38 | 50 |
| New Hampshire | 790 | 822 | 806 | 766 | 233 | 289 | 274 | 231 | 198 | 164 | 137 | 177 |
| Vermont | 5,554 | 5,665 | 5,722 | 5,665 | 1,602 | 1,694 | 1,133 | 966 | 980 | 1,417 | 1,038 | 1,083 |
| Massachusetts | 272 | 277 | 280 | 288 | 128 | 132 | 134 | 50 | 86 | 75 | 67 | 46 |
| New York | 3,958 | 3,839 | 3,647 | 3,647 | 1,168 | 733 | 549 | 334 | 1,128 | 1,002 | 718 | 615 |
| Pennsylvania | 696 | 626 | 607 | 565 | 223 | 148 | 67 | 43 | 251 | 139 | 157 | 85 |
| Ohio | 1,700 | 1,666 | 1,583 | 1,425 | 68 | 31 | 58 | 15 | 578 | 498 | 480 | 246 |
| Michigan | 863 | 828 | 869 | 886 | 100 | 72 | 70 | 40 | 300 | 172 | 208 | 163 |
| Wisconsin | 575 | 570 | 570 | 581 | 18 | 19 | 29 | 13 | 155 | 154 | 164 | 130 |
| Total 9 States ¹ | 14,712 | 14,603 | 14,388 | 14,130 | 3,569 | 3,133 | 2,317 | 1,706 | 3,737 | 3,671 | 3,007 | 2,595 |

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¹ These 9 States produced about 97 per cent of the maple sugar and about 92 per cent of the maple sirup made in the United States in 1919 as reported by the Bureau of the Census.

TABLE 167.—Tobacco: Acreage, yield, production, price, and farm value, by types, 1928-29

| Class and type name | Type No. | Acreage | | Yield per acre | | Production | | Average price per pound | | | Farm value | |
|-----------------------------------|----------|-----------|-----------|----------------|-------|------------|---------|-------------------------|-------------------|-------------------|------------|------|
| | | 1928 | 1929 | 1928 | 1929 | 1928 | 1929 | 1928 ¹ | 1929 ² | 1929 ³ | 1928 | 1929 |
| United States, all types..... | | | | | | | | | | | | |
| Class 1, fire cured..... | | | | | | | | | | | | |
| Old belt..... | | | | | | | | | | | | |
| Virginia..... | 11-14 | 1,140,200 | 1,134,700 | 649.7 | 672.5 | 740,807 | 763,131 | 17.7 | 18.2 | 130,975 | 136,493 | |
| North Carolina..... | 11 | 430,300 | 436,000 | 613.1 | 673.4 | 263,822 | 295,800 | 18.3 | 18.0 | 48,181 | 53,226 | |
| Eastern North Carolina belt..... | 11 | 138,300 | 126,000 | 531 | 650 | 73,438 | 81,900 | 17.1 | 18.0 | 12,579 | 14,734 | |
| South Carolina belt..... | 12 | 252,000 | 310,000 | 632 | 690 | 160,384 | 213,900 | 18.7 | 18.0 | 35,602 | 38,462 | |
| Georgia..... | 13 | 378,000 | 394,900 | 707 | 635 | 267,424 | 250,700 | 20.6 | 19.1 | 55,089 | 47,863 | |
| Florida..... | 14 | 121,000 | 108,600 | 685 | 812 | 82,867 | 88,184 | 12.8 | 18.4 | 10,583 | 16,208 | |
| Georgia..... | 14 | 7,900 | 8,100 | 608 | 760 | 4,806 | 6,155 | 12.0 | 18.1 | 577 | 1,113 | |
| Class 2, fire cured..... | | | | | | | | | | | | |
| Virginia..... | 21-24 | 183,800 | 213,000 | 719.1 | 811.5 | 132,179 | 172,857 | 14.0 | 12.9 | 18,447 | 22,318 | |
| Clarksville and Hopkinsville..... | 21 | 31,200 | 31,000 | 703 | 800 | 21,934 | 24,800 | 10.6 | 15.0 | 2,325 | 3,720 | |
| Kentucky..... | 22 | 105,000 | 119,500 | 718 | 763 | 75,419 | 94,425 | 15.6 | 13.5 | 11,749 | 12,734 | |
| Tennessee..... | 22 | 44,000 | 51,500 | 723 | 830 | 31,800 | 42,745 | 15.0 | 12.9 | 4,770 | 5,514 | |
| Paducah..... | 23 | 61,000 | 68,000 | 715 | 760 | 43,619 | 51,680 | 16.0 | 14.0 | 6,979 | 7,220 | |
| Kentucky..... | 23 | 39,600 | 52,300 | 728 | 862 | 28,826 | 45,064 | 12.7 | 10.8 | 3,653 | 4,879 | |
| Tennessee..... | 24 | 34,000 | 45,300 | 732 | 865 | 24,900 | 39,184 | 12.7 | 10.8 | 3,162 | 4,232 | |
| Henderson..... | 24 | 5,600 | 7,000 | 701 | 840 | 3,926 | 5,880 | 12.5 | 11.0 | 491 | 647 | |
| Class 3a, air cured, light..... | 31-32 | 867,300 | 449,200 | 792.5 | 756.5 | 291,073 | 339,853 | 30.2 | 22.4 | 87,826 | 76,156 | |
| Burley..... | 31 | 336,300 | 417,200 | 805 | 753 | 270,613 | 314,255 | 30.4 | 22.3 | 82,240 | 70,140 | |
| Ohio..... | 31 | 13,200 | 20,100 | 855 | 822 | 11,289 | 16,535 | 30.5 | 20.0 | 3,440 | 3,307 | |
| Indiana..... | 31 | 11,200 | 16,800 | 820 | 765 | 9,184 | 12,852 | 26.8 | 21.1 | 2,462 | 2,710 | |

| | | | | | | | | | | | |
|--|-------|---------|---------|---------|---------|---------|---------|------|------|--------|--------|
| Missouri..... | 31 | 4,000 | 4,500 | 1,100 | 900 | 4,400 | 4,050 | 28.6 | 25.0 | 1,258 | 1,012 |
| Virginia..... | 31 | 4,100 | 6,300 | 1,510 | 1,048 | 4,510 | 6,602 | 30.4 | 25.0 | 1,371 | 1,650 |
| West Virginia..... | 31 | 6,800 | 8,500 | 750 | 775 | 5,100 | 6,588 | 28.8 | 25.0 | 1,367 | 1,647 |
| North Carolina..... | 31 | 3,000 | 5,000 | 687 | 532 | 2,000 | 4,180 | 30.0 | 20.0 | 600 | 832 |
| Kentucky..... | 31 | 255,000 | 306,000 | 800 | 725 | 204,100 | 221,848 | 30.6 | 22.3 | 62,456 | 49,438 |
| Tennessee..... | 31 | 39,000 | 50,000 | 770 | 832 | 30,030 | 41,600 | 30.9 | 23.0 | 9,286 | 9,544 |
| Tennessee..... | 32 | 31,000 | 32,000 | 660 | 800 | 20,460 | 25,600 | 27.3 | 23.5 | 5,586 | 6,016 |
| Southern Maryland..... | | | | | | | | | | | |
| Class 3b, air cured, dark..... | 35-37 | 60,500 | 74,500 | 728.7 | 817.6 | 43,968 | 60,910 | 11.7 | 11.4 | 5,145 | 6,928 |
| One-sucker..... | 35 | 26,300 | 33,400 | 764 | 824 | 20,086 | 27,512 | 12.2 | 10.6 | 2,450 | 2,920 |
| Indiana..... | 35 | 2,300 | 3,500 | 820 | 825 | 1,886 | 2,888 | 11.0 | 10.0 | 207 | 289 |
| Kentucky..... | 35 | 20,000 | 24,000 | 730 | 825 | 14,000 | 21,120 | 12.3 | 10.8 | 1,875 | 2,281 |
| Tennessee..... | 36 | 4,000 | 4,300 | 800 | 815 | 3,200 | 3,504 | 11.5 | 10.0 | 368 | 380 |
| Green River..... | 36 | 27,000 | 34,400 | 700 | 825 | 18,900 | 28,380 | 11.6 | 12.0 | 2,192 | 3,408 |
| Virginia, sun cured..... | 37 | 7,200 | 6,700 | 692 | 749 | 4,982 | 5,018 | 10.1 | 12.0 | 503 | 602 |
| Class 4, cigar filler..... | 41-45 | 64,450 | 70,650 | 1,094.1 | 1,009.7 | 70,513 | 71,353 | 15.1 | 17.5 | 10,630 | 12,487 |
| Pennsylvania seed leaf..... | 41 | 36,350 | 38,150 | 1,341 | 1,233 | 48,740 | 47,051 | 13.9 | 17.9 | 6,779 | 8,417 |
| Ohio and Indiana (Miami Valley) ¹ | 42-44 | 26,500 | 30,800 | 757 | 724 | 20,073 | 22,307 | 17.5 | 16.5 | 3,511 | 3,675 |
| Georgia and Florida sun-grown..... | 45 | 1,600 | 1,700 | 1,062 | 1,162 | 1,700 | 1,975 | 20.0 | 20.0 | 340 | 395 |
| Class 5, cigar binder..... | 51-55 | 63,600 | 59,350 | 1,301.8 | 1,291.7 | 82,796 | 76,663 | 17.7 | 22.3 | 14,696 | 17,083 |
| Connecticut Valley broadleaf..... | 51 | 10,800 | 7,400 | 1,311 | 1,404 | 14,162 | 10,390 | 21.0 | 30.2 | 2,974 | 3,140 |
| Connecticut Valley Havana seed..... | 52 | 13,350 | 12,100 | 1,309 | 1,486 | 17,474 | 17,983 | 24.0 | 34.5 | 4,196 | 6,205 |
| Georgia-Florida shade-grown..... | 53 | 1,450 | 1,350 | 1,283 | 1,234 | 1,860 | 1,350 | 19.3 | 19.0 | 359 | 256 |
| New York and Pennsylvania Havana seed..... | 54 | 22,200 | 22,600 | 1,353 | 1,234 | 30,044 | 27,860 | 13.7 | 14.8 | 4,116 | 4,112 |
| Southern Wisconsin..... | 55 | 15,800 | 15,900 | 1,219 | 1,200 | 19,256 | 19,080 | 15.8 | 17.7 | 3,051 | 3,380 |
| Northern Wisconsin and Minnesota..... | | | | | | | | | | | |
| Class 6, cigar wrapper..... | 61-65 | 12,250 | 12,800 | 953.8 | 1,142.1 | 11,806 | 14,619 | 80.0 | 81.2 | 9,445 | 11,864 |
| Connecticut Valley shade-grown..... | 61 | 8,000 | 8,700 | 867 | 1,115 | 6,936 | 9,703 | 99.9 | 95.0 | 6,932 | 9,218 |
| Georgia-Florida shade-grown..... | 62 | 3,800 | 3,900 | 1,113 | 1,186 | 4,230 | 4,628 | 54.9 | 55.0 | 2,321 | 2,544 |
| Connecticut Valley primed Havana seed..... | 65 | 430 | 200 | 1,422 | 1,430 | 4,640 | 290 | 30.0 | 35.2 | 1,192 | 2,102 |
| Class 7, miscellaneous..... | 70 | 2,000 | 2,200 | 702.5 | 701.4 | 1,405 | 1,543 | 24.3 | 15.8 | 342 | 244 |
| Louisiana Perique..... | 70 | 1,000 | 1,000 | 405 | 378 | 405 | 378 | 45.0 | 40.0 | 182 | 151 |
| Eastern Ohio..... | 70 | 1,000 | 1,200 | 1,000 | 971 | 1,000 | 1,165 | 16.0 | 8.0 | 160 | 93 |

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 Note.—1929 figures subject to revision on basis of later information.

¹ Revised.

² Estimated seasonal average price based on sales to Dec. 1.

³ Gebhardt, Zimmer, and Dutch combined.

TABLE 168.—*Tobacco, unmanufactured: Acreage, production, value, exports, etc.; United States, 1890-1929*

| Year | Acreage | Average yield per acre | Production | Price per pound received by producers Dec. 1 | Farm value, Dec. 1 | Domestic exports, year beginning July 1 ¹ | Imports, year beginning July 1 ¹ | Net exports, year beginning July 1 ¹ |
|-------------------------|------------------------|------------------------|------------------------|--|---------------------|--|---|---|
| | <i>Acres</i> | <i>Lbs.</i> | <i>1,000 lbs.</i> | <i>Cts.</i> | <i>1,000 dolls.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> |
| 1890..... | 722,028 | 722.8 | 518,683 | 8.3 | 42,846 | 249,233 | 23,255 | 227,254 |
| 1891..... | 738,216 | 747.4 | 551,777 | 8.5 | 47,074 | 255,432 | 21,989 | 234,587 |
| 1892..... | 720,189 | 687.6 | 495,209 | 9.3 | 46,044 | 266,083 | 28,110 | 230,153 |
| 1893..... | 702,952 | 687.1 | 483,084 | 8.1 | 39,155 | 290,685 | 19,063 | 272,083 |
| 1894..... | 523,103 | 777.4 | 406,078 | 6.8 | 27,761 | 300,992 | 26,668 | 276,223 |
| 1895..... | 633,950 | 775.4 | 491,544 | 7.2 | 35,574 | 295,539 | 32,925 | 266,317 |
| 1896..... | 594,749 | 677.6 | 403,004 | 6.0 | 24,258 | 314,932 | 13,805 | 302,847 |
| 1897..... | ² 945,604 | 646.0 | 610,860 | | | 263,020 | 10,477 | 254,907 |
| 1898..... | ³ 933,868 | 748.0 | 698,533 | | | 283,613 | 14,036 | 271,659 |
| 1899..... | ¹ 1,101,460 | 738.1 | 868,113 | | | | | |
| 1899..... | 1,101,500 | 728.5 | 802,397 | 7.1 | 57,273 | 344,656 | 19,620 | 326,939 |
| 1900..... | 1,046,427 | 778.2 | 814,345 | 6.6 | 53,061 | 315,788 | 26,851 | 290,915 |
| 1901..... | 1,039,199 | 788.0 | 818,963 | 7.1 | 58,283 | 301,007 | 29,429 | 273,770 |
| 1902..... | 1,030,734 | 797.3 | 821,824 | 7.0 | 57,564 | 368,184 | 34,017 | 337,902 |
| 1903..... | 1,037,735 | 786.3 | 815,972 | 6.8 | 55,515 | 311,972 | 31,163 | 286,335 |
| 1904..... | 806,409 | 819.0 | 660,461 | 8.1 | 53,383 | 334,302 | 33,288 | 304,694 |
| 1905..... | 776,112 | 815.6 | 633,034 | 8.5 | 53,519 | 312,227 | 41,126 | 273,912 |
| 1906..... | 796,099 | 857.2 | 682,420 | 10.0 | 68,233 | 340,743 | 40,899 | 302,506 |
| 1907..... | 820,800 | 850.5 | 698,126 | 10.2 | 71,411 | 330,813 | 35,005 | 297,657 |
| 1908..... | 875,425 | 820.2 | 718,061 | 10.3 | 74,130 | 287,901 | 43,123 | 247,155 |
| 1909..... | ¹ 1,294,911 | 815.8 | ¹ 1,055,765 | | | | | |
| 1909..... | 1,294,900 | 814.8 | 1,055,133 | 10.1 | 106,374 | 357,196 | 46,838 | 313,085 |
| 1910..... | 1,366,100 | 807.7 | 1,103,415 | 9.3 | 102,142 | 355,327 | 48,203 | 308,171 |
| 1911..... | 1,013,000 | 893.7 | 905,109 | 9.4 | 85,210 | 379,845 | 54,740 | 327,199 |
| 1912..... | 1,226,000 | 785.5 | 962,855 | 10.8 | 104,063 | 414,797 | 67,977 | 353,575 |
| 1913..... | 1,216,100 | 784.3 | 953,734 | 12.8 | 122,481 | 449,750 | 61,175 | 391,196 |
| 1914..... | 1,223,500 | 845.7 | 1,034,679 | 9.8 | 101,411 | 348,346 | 45,809 | 306,426 |
| 1915..... | 1,369,900 | 775.4 | 1,062,237 | 9.1 | 96,281 | 443,203 | 48,078 | 400,624 |
| 1916..... | 1,413,400 | 816.0 | 1,153,278 | 14.7 | 169,672 | 411,509 | 49,105 | 370,987 |
| 1917..... | 1,517,800 | 823.1 | 1,249,276 | 24.0 | 300,449 | 289,171 | 86,991 | 211,962 |
| 1918..... | 1,647,100 | 873.7 | 1,439,071 | 28.0 | 402,264 | 629,288 | 83,951 | 577,323 |
| 1919..... | ¹ 1,864,080 | 736.6 | ¹ 1,372,893 | | | | | |
| 1919..... | 1,951,000 | 751.1 | 1,465,481 | 39.0 | 570,868 | 648,038 | 94,005 | 570,858 |
| 1920..... | 1,960,000 | 807.3 | 1,582,225 | 21.2 | 335,675 | 506,526 | 58,923 | 456,477 |
| 1921..... | 1,427,000 | 749.6 | 1,069,693 | 19.9 | 212,728 | 463,389 | 65,225 | 403,492 |
| 1922..... | 1,695,000 | 735.6 | 1,246,837 | 23.2 | 289,248 | 454,364 | 73,796 | 386,213 |
| 1923..... | 1,877,000 | 807.2 | 1,515,110 | 19.9 | 301,096 | 597,630 | 52,380 | 550,404 |
| 1924..... | ¹ 1,587,843 | 719.4 | ¹ 1,106,340 | | | | | |
| 1924..... | 1,705,800 | 733.6 | 1,251,343 | 20.7 | 250,139 | 430,702 | 75,131 | 357,478 |
| 1925..... | 1,757,300 | 783.3 | 1,376,628 | 18.2 | 250,774 | 537,240 | 68,281 | 470,651 |
| 1926..... | 1,656,400 | 783.6 | 1,297,889 | 18.2 | 236,702 | 616,402 | 91,089 | 426,545 |
| 1927..... | 1,584,900 | 764.7 | 1,211,909 | 21.2 | 256,882 | 489,996 | 79,112 | 413,299 |
| 1928..... | 1,894,100 | 725.7 | 1,374,547 | ⁴ 20.2 | 277,506 | 565,987 | 76,891 | 491,604 |
| 1929 ⁵ | 2,016,400 | 744.3 | 1,500,891 | ⁴ 19.0 | 285,583 | | | |

Bureau of Agricultural Economics. Italics figures are census returns, other acreage, yield, and production figures are estimates of the crop-reporting board. See p. 970, 1927 Yearbook, for data for earlier years.

¹ Compiled from Commerce and Navigation of the United States, 1890-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States; June issues 1919-1923, January and June issues, 1927-1929, and official records of the Bureau of Foreign and Domestic Commerce.

² Total exports (domestic exports plus foreign) minus reexports.

³ Revised on basis of 1899.

⁴ Season average price.

⁵ Preliminary.

TABLE 169.—*Tobacco: Acreage and production, by States, average 1923-1927 annual 1927-1929*

| State | Acreage | | | | Production | | | |
|---------------------|----------------------|--------------|--------------|-------------------|----------------------|-------------------|-------------------|-------------------|
| | Average 1923-1927 | 1927 | 1928 | 1929 ¹ | Average 1923-1927 | 1927 | 1928 | 1929 ¹ |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> |
| Massachusetts..... | 8,040 | 7,100 | 7,600 | 7,400 | 10,707 | 8,683 | 9,462 | 10,730 |
| Connecticut..... | 28,600 | 23,700 | 25,000 | 21,000 | 35,612 | 28,985 | 29,750 | 27,636 |
| New York..... | 1,600 | 800 | 800 | 800 | 1,816 | 960 | 1,020 | 800 |
| Pennsylvania..... | 39,800 | 34,000 | 37,000 | 38,700 | 52,730 | 46,240 | 49,580 | 47,601 |
| Ohio..... | 46,280 | 30,100 | 40,500 | 51,800 | 39,289 | 24,652 | 32,198 | 39,782 |
| Indiana..... | 17,420 | 8,400 | 13,700 | 20,600 | 15,240 | 6,384 | 11,234 | 15,965 |
| Wisconsin..... | 34,800 | 31,000 | 37,000 | 37,000 | 38,866 | 33,170 | 48,100 | 45,140 |
| Minnesota..... | | | 1,000 | 1,500 | | | 1,200 | 1,800 |
| Missouri..... | 5,000 | 4,000 | 4,000 | 4,500 | 4,817 | 4,400 | 4,400 | 4,050 |
| Maryland..... | 30,400 | 32,000 | 31,000 | 32,000 | 24,554 | 26,176 | 20,460 | 25,600 |
| Virginia..... | 196,000 | 177,000 | 180,800 | 170,000 | 136,373 | 127,971 | 104,864 | 118,320 |
| West Virginia..... | 8,100 | 4,500 | 6,800 | 8,500 | 6,581 | 3,488 | 5,488 | 6,588 |
| North Carolina..... | 570,600 | 659,000 | 728,000 | 764,000 | 389,715 | 485,683 | 499,408 | 508,060 |
| South Carolina..... | 96,200 | 104,000 | 148,000 | 133,000 | 64,904 | 76,648 | 82,288 | 82,992 |
| Georgia..... | 51,480 | 81,500 | 122,300 | 110,000 | 37,922 | 59,088 | 84,387 | 89,870 |
| Florida..... | 6,360 | 8,800 | 12,000 | 12,300 | 5,730 | 8,228 | 9,216 | 11,070 |
| Kentucky..... | 451,640 | 290,200 | 388,000 | 473,000 | 369,695 | 202,269 | 300,700 | 361,845 |
| Tennessee..... | 124,960 | 87,800 | 109,600 | 129,300 | 95,591 | 68,484 | 80,775 | 102,664 |
| Louisiana..... | 1,000 | 1,000 | 1,000 | 1,000 | 434 | 400 | 405 | 378 |
| United States.. | 1,716,280 | 1,584,960 | 1,894,100 | 2,016,400 | 1,330,576 | 1,211,909 | 1,374,547 | 1,500,891 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.TABLE 170.—*Tobacco: Yield per acre and estimated price per pound, December 1, by States, averages and annual 1924-1929*

| State | Yield per acre | | | | | | | Estimated price per pound | | | | | | |
|---------------------|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------------|-------------|-------------|-------------|-------------|-------------------|-------------------|
| | Av. 1918- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Av. 1923- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 ¹ | 1929 ¹ |
| | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| Massachusetts..... | 1,369 | 1,340 | 1,243 | 1,448 | 1,223 | 1,245 | 1,450 | 31.5 | 26.8 | 16.0 | 35.0 | 35.7 | 34.1 | 44.4 |
| Connecticut..... | 1,372 | 1,370 | 1,352 | 1,340 | 1,223 | 1,190 | 1,316 | 34.0 | 32.3 | 19.0 | 35.6 | 36.6 | 37.2 | 50.3 |
| New York..... | 1,188 | 1,175 | 1,100 | 1,100 | 1,200 | 1,275 | 1,000 | 20.3 | 22.3 | 22.0 | 19.0 | 18.0 | 19.3 | 19.0 |
| Pennsylvania..... | 1,367 | 1,250 | 1,400 | 1,320 | 1,360 | 1,340 | 1,230 | 14.5 | 15.7 | 15.0 | 10.5 | 13.0 | 14.0 | 17.9 |
| Ohio..... | 887 | 705 | 974 | 846 | 819 | 795 | 768 | 15.5 | 19.4 | 15.0 | 10.1 | 18.4 | 22.0 | 17.7 |
| Indiana..... | 871 | 893 | 871 | 884 | 760 | 820 | 775 | 16.1 | 16.6 | 18.0 | 9.7 | 22.0 | 24.0 | 19.0 |
| Wisconsin..... | 1,190 | 940 | 1,375 | 1,150 | 1,070 | 1,300 | 1,220 | 14.1 | 13.0 | 16.5 | 13.8 | 16.0 | 14.6 | 16.0 |
| Minnesota..... | | | | | | 1,200 | 1,200 | | | | | | 12.0 | 15.0 |
| Missouri..... | 954 | 852 | 815 | 950 | 1,100 | 1,100 | 900 | 23.4 | 25.6 | 27.0 | 15.0 | 22.0 | 28.6 | 25.0 |
| Maryland..... | 790 | 765 | 823 | 840 | 818 | 660 | 800 | 24.1 | 26.9 | 19.0 | 23.7 | 23.0 | 27.3 | 23.5 |
| Virginia..... | 682 | 650 | 647 | 725 | 723 | 580 | 696 | 18.4 | 21.4 | 15.6 | 17.6 | 17.8 | 16.0 | 17.5 |
| West Virginia..... | 783 | 775 | 775 | 850 | 775 | 750 | 775 | 19.8 | 21.4 | 18.2 | 13.1 | 24.5 | 26.8 | 25.0 |
| North Carolina..... | 647 | 577 | 695 | 684 | 737 | 686 | 665 | 24.1 | 25.8 | 23.0 | 26.4 | 22.0 | 19.5 | 18.5 |
| South Carolina..... | 672 | 485 | 740 | 668 | 737 | 556 | 624 | 19.4 | 17.0 | 17.0 | 23.3 | 20.5 | 12.7 | 16.0 |
| Georgia..... | 669 | 777 | 720 | 770 | 725 | 690 | 817 | 23.2 | 26.6 | 15.0 | 24.0 | 19.4 | 13.2 | 18.7 |
| Florida..... | 952 | 750 | 832 | 968 | 935 | 768 | 900 | 38.4 | 37.6 | 31.0 | 37.8 | 34.8 | 29.1 | 31.2 |
| Kentucky..... | 835 | 836 | 810 | 842 | 697 | 775 | 765 | 16.3 | 17.1 | 16.0 | 10.6 | 21.4 | 25.0 | 18.2 |
| Tennessee..... | 765 | 795 | 726 | 781 | 780 | 737 | 794 | 16.4 | 18.6 | 17.0 | 10.6 | 21.4 | 21.2 | 17.3 |
| Louisiana..... | 442 | 400 | 504 | 400 | 400 | 405 | 378 | 50.0 | 65.0 | 55.0 | 45.0 | 45.0 | 45.0 | 40.0 |
| United States.. | 779.0 | 733.6 | 783.3 | 783.6 | 764.7 | 725.7 | 744.3 | 19.6 | 20.7 | 18.2 | 18.2 | 21.2 | 20.2 | 19.0 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Season average price.

TABLE 171.—*Tobacco: Acreage, yield per acre, and production in specified countries, annual 1927–1929*

| Country | Acreage | | | Yield per acre | | | Production | | |
|--|----------------|----------------|---------------------------------|----------------|-------|---------------------------------|-----------------|-----------------|---------------------------------|
| | 1927 | 1928 | 1929 (Pre- limi- nary) | 1927 | 1928 | 1929 (Pre- limi- nary) | 1927 | 1928 | 1929 (Pre- limi- nary) |
| North America, Central America and West Indies: | 1,000 acres | 1,000 acres | 1,000 acres | Lbs. | Lbs. | Lbs. | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Canada | 44 | 43 | 38 | 998 | 976 | 784 | 43,910 | 41,976 | 29,786 |
| United States | 1,585 | 1,894 | 2,016 | 765 | 726 | 744 | 1,211,909 | 1,374,547 | 1,500,891 |
| Mexico | 41 | 42 | — | 541 | 615 | — | 22,165 | 25,829 | — |
| Cuba | — | — | — | — | — | — | 57,360 | 60,000 | — |
| Dominican Republic ² | — | — | — | — | — | — | 40,000 | 30,000 | 45,000 |
| Porto Rico | 83 | 40 | 39 | 569 | 533 | 631 | 47,250 | 21,326 | 24,600 |
| Europe: | | | | | | | | | |
| Sweden | 1 | — | — | 1,231 | — | — | 1,231 | — | — |
| Belgium | 8 | 8 | 7 | 2,004 | 1,940 | 1,767 | 16,035 | 15,522 | 12,372 |
| France | 39 | 38 | — | 1,625 | 1,317 | — | 63,380 | 50,062 | — |
| Italy | 92 | 95 | 96 | 719 | 846 | 1,011 | 66,173 | 80,408 | 97,034 |
| Germany | 23 | 25 | 24 | 1,914 | 2,078 | — | 44,013 | 51,948 | — |
| Czechoslovakia | 13 | 15 | 16 | 1,293 | 1,000 | 1,116 | 16,804 | 15,007 | 17,858 |
| Hungary | 58 | 56 | — | 1,191 | 1,035 | — | 69,095 | 57,982 | — |
| Yugoslavia | 27 | 28 | 38 | 543 | 462 | 684 | 14,671 | 12,944 | 26,000 |
| Greece | 228 | 230 | 1,278 | 611 | 563 | 629 | 139,367 | 129,493 | 175,000 |
| Bulgaria | 60 | 53 | 84 | 797 | 435 | 655 | 47,829 | 23,041 | 55,060 |
| Rumania | 76 | 68 | 76 | 585 | 501 | — | 44,430 | 34,080 | — |
| Poland | 7 | 9 | — | 1,507 | 1,590 | — | 10,550 | 14,308 | — |
| Russia | 222 | 207 | — | 1,663 | 1,410 | — | 369,204 | 291,955 | — |
| North Africa: | | | | | | | | | |
| Algeria | 72 | 65 | — | 814 | 848 | — | 58,583 | 55,128 | — |
| Tunis | 1 | 2 | 2 | 1,197 | 782 | 772 | 1,197 | 1,564 | 1,543 |
| French West Africa | 51 | — | — | 250 | — | — | 12,743 | — | — |
| Asia: | | | | | | | | | |
| Turkey | 194 | 150 | — | 765 | 633 | — | 148,384 | 95,000 | 99,000 |
| Persia ¹ | — | — | — | — | — | — | 26,500 | 26,000 | — |
| Palestine | 2 | 2 | — | 603 | 355 | — | 1,206 | 710 | — |
| Syria | 7 | 6 | 9 | 520 | 467 | 666 | 3,638 | 2,804 | 5,997 |
| India | 1,208 | 1,275 | — | — | 1,058 | — | — | 1,348,480 | — |
| Ceylon | 13 | 13 | — | 692 | 692 | — | 9,000 | 9,000 | — |
| Indo-China ³ | 14 | 12 | — | 409 | 664 | — | 5,732 | 7,967 | — |
| Japan | 91 | 92 | 88 | 1,652 | 1,600 | 1,569 | 150,323 | 147,159 | 138,065 |
| Chosen (Korea) | 41 | 49 | — | 882 | 939 | — | 36,147 | 45,988 | — |
| Taiwan (Formosa) | 2 | 2 | — | 1,308 | 1,655 | — | 2,735 | 3,310 | — |
| Siam | 22 | 23 | — | 440 | 424 | — | 9,686 | 9,763 | — |
| Philippine Islands | 207 | 200 | — | 535 | 509 | — | 110,707 | 101,801 | — |
| South America: | | | | | | | | | |
| Colombia | 32 | — | — | 688 | — | — | 22,000 | — | — |
| Brazil | 185 | — | — | 811 | — | — | 150,000 | — | — |
| Paraguay | — | — | — | — | — | — | 19,727 | — | — |
| Chile | 6 | — | — | 1,803 | — | — | 10,819 | — | — |
| Argentina | 23 | — | — | 1,316 | — | — | 30,265 | — | — |
| South Africa: | | | | | | | | | |
| French Equatorial Africa | 16 | — | — | 62 | — | — | 991 | — | — |
| Union of South Africa | 40 | — | — | 578 | — | — | 23,102 | 14,500 | — |
| Southern Rhodesia | 47 | 18 | — | 531 | 422 | — | 24,943 | 7,600 | — |
| Northern Rhodesia ⁴ | 7 | — | — | 466 | — | — | 3,262 | — | — |
| Nyasaland | — | — | — | — | — | — | 14,520 | — | — |
| Madagascar | 13 | — | — | 1,102 | — | — | 14,330 | — | — |
| Oceania: | | | | | | | | | |
| Dutch East Indies, Java and Madura ⁵ | 67 | 77 | — | 844 | 902 | — | 56,516 | 69,447 | — |
| Sumatra ⁶ | 49 | 63 | — | 842 | 743 | — | 41,270 | 46,789 | — |
| Australia ⁷ | 1 | — | — | 794 | — | — | 794 | — | — |
| Total all countries reporting acreage or production, all years | 2,338 | 2,599 | 2,811 | — | — | — | 1,947,490 | 1,990,791 | 2,228,166 |
| Estimated world total exclusive of India and China ⁸ | — | — | — | — | — | — | 3,670,000 | — | — |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Figures refer to the crop harvested in the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere except in the Dutch East Indies, where the harvest is largely completed within the calendar year.

¹ Unofficial estimate.

² Unofficial estimate of the export crop.

³ Annam and Cochin-China only. In addition in 1927: Cambodia, 7,544,141 pounds and 8,000 acres; Tonking, 4,542 acres; Laos, 1,228,000 pounds. In 1928: Tonking, 3,400 acres; Laos, 414,000 pounds.

⁴ European cultivation only.

⁵ Estate production only. Figures for native production not available. Total production of the islands is roughly estimated, on the basis of average yield of 311 pounds per acre for the native area, with the addition of the estate production, at 185,000,000 pounds in 1927 and 205,000,000 pounds in 1928.

⁶ Estate production only.

⁷ Exclusive of Victoria with an area of 1,176 acres.

⁸ No data are available for the total production for India prior to 1928 or for China. Both are of considerable importance.

STATISTICS OF COTTON, SUGAR, AND TOBACCO

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TABLE 172.—*Tobacco: Production, stocks, supply, disappearance, and price, 1912-1929*

FLUE-CURED, TYPES 11-14

| Year | Production ¹ | Stocks on hand July 1 | Total supply | Disappearance, year beginning July 1 ¹ | Average price per pound |
|-----------|-------------------------|-----------------------|----------------|---|-------------------------|
| | Million pounds | Million pounds | Million pounds | Million pounds | Cents |
| 1913..... | 282.8 | ² 211.0 | 493.8 | 262.3 | 18.3 |
| 1914..... | 275.4 | ² 231.5 | 506.9 | 238.3 | 11.3 |
| 1915..... | 312.0 | ² 268.6 | 580.6 | 301.2 | 10.5 |
| 1916..... | 263.3 | ² 279.4 | 542.7 | 289.3 | 19.0 |
| 1917..... | 358.8 | 253.4 | 612.2 | 319.8 | 30.5 |
| 1918..... | 487.1 | 292.4 | 779.5 | 452.2 | 34.3 |
| 1919..... | 487.5 | 327.3 | 814.8 | 510.6 | 44.6 |
| 1920..... | 630.8 | 304.2 | 935.0 | 451.9 | 21.1 |
| 1921..... | 371.4 | 483.1 | 854.5 | 413.8 | 21.7 |
| 1922..... | 408.8 | 440.7 | 849.5 | 410.8 | 29.0 |
| 1923..... | 592.9 | 438.7 | 1,031.6 | 555.0 | 22.3 |
| 1924..... | 436.8 | 476.6 | 913.4 | 451.1 | 22.5 |
| 1925..... | 576.3 | 402.3 | 1,038.6 | 583.2 | 20.0 |
| 1926..... | 564.5 | 455.4 | 1,019.9 | 553.4 | 25.6 |
| 1927..... | 715.9 | 466.5 | 1,182.4 | 617.4 | 21.3 |
| 1928..... | 740.8 | 565.0 | 1,305.8 | 715.8 | 17.7 |
| 1929..... | ² 763.1 | 590.0 | 1,353.1 | ----- | ² 18.2 |

VIRGINIA FIRE-CURED, TYPE 21

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound |
|-----------|-------------------------|-----------------------|----------------|---|-------------------------|
| | Million pounds | Million pounds | Million pounds | Million pounds | Cents |
| 1912..... | 49.5 | 34.6 | 84.1 | 50.4 | 7.8 |
| 1913..... | 58.4 | 33.7 | 92.1 | 57.9 | 7.0 |
| 1914..... | 37.0 | 34.2 | 71.2 | 42.5 | 7.3 |
| 1915..... | 54.6 | 28.7 | 83.3 | 44.5 | 8.0 |
| 1916..... | 53.8 | 38.8 | 92.6 | 47.4 | 10.4 |
| 1917..... | 51.5 | 45.2 | 96.7 | 54.9 | 17.0 |
| 1918..... | 60.2 | 41.8 | 102.0 | 67.8 | 17.7 |
| 1919..... | 36.6 | 34.2 | 70.8 | 40.0 | 25.0 |
| 1920..... | 45.6 | 30.8 | 76.4 | 41.8 | 9.1 |
| 1921..... | 24.6 | 34.6 | 59.2 | 34.5 | 18.8 |
| 1922..... | 49.1 | 24.7 | 73.8 | 46.8 | 19.8 |
| 1923..... | 43.8 | 27.0 | 70.8 | 36.6 | 18.1 |
| 1924..... | 43.1 | 34.2 | 77.3 | 34.2 | 19.4 |
| 1925..... | 42.0 | 43.1 | 85.1 | 35.2 | 16.2 |
| 1926..... | 43.8 | 49.9 | 93.7 | 37.6 | 7.8 |
| 1927..... | 26.6 | 56.1 | 82.7 | 33.7 | 9.0 |
| 1928..... | 21.9 | 49.0 | 70.9 | 39.6 | 10.6 |
| 1929..... | ² 24.8 | 31.3 | 56.1 | ----- | ² 15.0 |

¹ Green weight basis, i. e., farmers' sales weight. Disappearance includes consumption, exports, and losses.

² Estimated.

³ Estimated December, 1929.

TABLE 172.—*Tobacco: Production, stocks, supply, disappearance, and price, 1912-1929—Continued*

KENTUCKY AND TENNESSEE FIRE-CURED, TYPES 22 AND 23

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound | |
|-----------|-------------------------|-----------------------|----------------|---|--------------------------------|-------------------|
| | | | | | Clarks-ville and Hopkins-ville | Paducah |
| | Million pounds | Million pounds | Million pounds | Million pounds | Cents | Cents |
| 1912..... | 111.2 | 91.1 | 232.3 | 120.7 | 7.8 | 6.2 |
| 1913..... | 139.0 | 111.6 | 250.6 | 108.8 | 9.0 | 7.7 |
| 1914..... | 133.7 | 141.8 | 275.5 | 125.7 | 7.5 | 6.1 |
| 1915..... | 157.0 | 139.8 | 306.8 | 184.4 | 6.5 | 6.0 |
| 1916..... | 176.8 | 122.4 | 299.2 | 171.2 | 10.8 | 9.8 |
| 1917..... | 190.4 | 128.0 | 318.4 | 121.3 | 14.8 | 14.0 |
| 1918..... | 153.0 | 197.1 | 350.1 | 208.1 | 22.6 | 21.0 |
| 1919..... | 233.7 | 142.0 | 375.7 | 196.4 | 19.8 | 15.4 |
| 1920..... | 180.5 | 179.3 | 359.8 | 204.1 | 11.6 | 9.5 |
| 1921..... | 132.9 | 153.7 | 286.6 | 158.4 | 16.7 | 13.0 |
| 1922..... | 181.9 | 130.2 | 312.1 | 171.2 | 15.9 | 13.2 |
| 1923..... | 199.0 | 140.9 | 339.9 | 196.5 | 12.2 | 10.9 |
| 1924..... | 156.3 | 143.1 | 299.7 | 148.5 | 15.5 | 9.8 |
| 1925..... | 154.4 | 151.2 | 305.6 | 136.4 | 10.1 | 6.9 |
| 1926..... | 129.2 | 169.2 | 298.1 | 136.5 | 8.4 | 6.0 |
| 1927..... | 81.0 | 161.9 | 242.9 | 128.8 | 18.5 | 12.2 |
| 1928..... | 104.2 | 114.1 | 218.3 | 111.2 | 15.6 | 12.7 |
| 1929..... | ² 139.5 | 104.1 | 243.6 | ----- | ² 13.5 | ² 10.8 |

HENDERSON FIRE-CURED (HENDERSON STEMMING) TYPE 21

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound |
|-----------|-------------------------|-----------------------|----------------|---|-------------------------|
| | | | | | |
| | Million pounds | Million pounds | Million pounds | Million pounds | Cents |
| 1923..... | 14.6 | 3.0 | 17.6 | 13.8 | 12.8 |
| 1924..... | 14.2 | 3.8 | 18.0 | 12.2 | 12.0 |
| 1925..... | 14.0 | 5.8 | 19.8 | 12.4 | 7.3 |
| 1926..... | 9.9 | 7.4 | 17.3 | 10.1 | 7.4 |
| 1927..... | 4.2 | 7.2 | 11.4 | 6.8 | 9.7 |
| 1928..... | 6.0 | 4.6 | 10.6 | 9.9 | 12.0 |
| 1929..... | ² 8.6 | .7 | 9.3 | ----- | ² 11.5 |

BURLEY, TYPE 31

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound |
|-----------|-------------------------|-----------------------|----------------|---|-------------------------|
| | Million pounds | Million pounds | Million pounds | Million pounds | Cents |
| 1912..... | 196.1 | 215.3 | 411.4 | 186.2 | 11.0 |
| 1913..... | 176.8 | 225.2 | 402.0 | 198.3 | 12.3 |
| 1914..... | 224.7 | 203.7 | 428.4 | 178.6 | 8.1 |
| 1915..... | 217.3 | 249.8 | 467.1 | 267.8 | 9.5 |
| 1916..... | 257.0 | 199.3 | 456.3 | 248.7 | 15.5 |
| 1917..... | 251.5 | 207.6 | 459.1 | 269.0 | 26.5 |
| 1918..... | 312.0 | 190.1 | 502.1 | 272.2 | 32.6 |
| 1919..... | 277.6 | 229.9 | 507.5 | 239.7 | 33.2 |
| 1920..... | 315.3 | 267.8 | 583.1 | 258.7 | 13.4 |
| 1921..... | 220.8 | 324.4 | 545.2 | 264.3 | 22.4 |
| 1922..... | 275.6 | 280.9 | 556.5 | 213.6 | 25.2 |
| 1923..... | 329.5 | 342.9 | 672.4 | 244.1 | 21.4 |
| 1924..... | 299.2 | 428.3 | 727.5 | 268.4 | 21.3 |
| 1925..... | 275.1 | 459.1 | 734.2 | 268.2 | 19.0 |
| 1926..... | 301.0 | 466.0 | 767.0 | 315.7 | 13.1 |
| 1927..... | 180.2 | 451.3 | 631.5 | 283.7 | 26.0 |
| 1928..... | 270.6 | 347.8 | 618.4 | 286.0 | 30.4 |
| 1929..... | ² 314.2 | 332.4 | 646.6 | ----- | ² 22.3 |

¹ Green weight basis, i. e., farmers sales weight. Disappearance includes consumption, exports, and losses.² Estimated December, 1929.

STATISTICS OF COTTON, SUGAR, AND TOBACCO

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TABLE 172.—*Tobacco: Production, stocks, supply, disappearance, and price, 1912-1929—Continued*

SOUTHERN MARYLAND, TYPE 32

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound |
|------|-------------------------|-----------------------|----------------|---|-------------------------|
| | Million pounds | Million pounds | Million pounds | Million pounds | Cents |
| 1912 | 22.0 | 9.4 | 31.4 | 23.9 | 8.1 |
| 1913 | 21.0 | 7.5 | 28.5 | 18.9 | 9.1 |
| 1914 | 20.4 | 9.6 | 30.0 | 8.2 | 8.0 |
| 1915 | 18.2 | 21.8 | 40.0 | 27.5 | 8.5 |
| 1916 | 23.4 | 12.5 | 35.9 | 15.7 | 15.6 |
| 1917 | 25.9 | 20.2 | 46.1 | 21.7 | 20.0 |
| 1918 | 32.7 | 21.4 | 57.1 | 28.9 | 30.0 |
| 1919 | 26.0 | 28.2 | 54.2 | 26.6 | 24.4 |
| 1920 | 36.9 | 27.6 | 64.5 | 35.7 | 18.6 |
| 1921 | 20.3 | 28.8 | 49.1 | 25.6 | 19.0 |
| 1922 | 22.2 | 23.5 | 45.7 | 30.1 | 17.4 |
| 1923 | 22.1 | 15.6 | 37.7 | 20.4 | 27.5 |
| 1924 | 22.8 | 17.3 | 40.1 | 21.9 | 26.7 |
| 1925 | 25.1 | 18.2 | 43.3 | 22.8 | 23.6 |
| 1926 | 26.6 | 20.5 | 47.1 | 24.3 | 23.5 |
| 1927 | 27.0 | 22.8 | 49.8 | 23.7 | 22.8 |
| 1928 | 21.5 | 26.1 | 47.6 | 27.0 | 28.8 |
| 1929 | ² 26.8 | 20.6 | 47.4 | | ³ 28.8 |

ONE SUCKER, TYPE 35

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound |
|------|-------------------------|-----------------------|--------------|---|-------------------------|
| 1912 | 42.8 | 22.6 | 65.4 | 33.5 | 6.5 |
| 1913 | 28.2 | 31.9 | 60.1 | 32.3 | 7.1 |
| 1914 | 36.9 | 27.8 | 64.7 | 42.4 | 5.6 |
| 1915 | 30.0 | 22.3 | 52.3 | 35.6 | 5.5 |
| 1916 | 41.8 | 16.7 | 58.5 | 39.9 | 10.0 |
| 1917 | 45.0 | 18.6 | 63.6 | 27.7 | 17.0 |
| 1918 | 45.0 | 35.9 | 80.9 | 48.4 | 14.4 |
| 1919 | 69.8 | 32.5 | 102.3 | 57.7 | 13.4 |
| 1920 | 53.7 | 44.6 | 98.3 | 50.7 | 7.0 |
| 1921 | 27.6 | 47.6 | 75.2 | 38.8 | 12.0 |
| 1922 | 50.4 | 36.4 | 86.8 | 53.0 | 12.2 |
| 1923 | 54.1 | 33.8 | 87.9 | 46.1 | 10.1 |
| 1924 | 39.1 | 41.8 | 80.9 | 38.5 | 11.2 |
| 1925 | 35.5 | 42.4 | 77.9 | 28.0 | 8.3 |
| 1926 | 30.8 | 49.9 | 80.7 | 30.0 | 5.7 |
| 1927 | 13.1 | 41.7 | 54.8 | 27.9 | 10.6 |
| 1928 | 20.1 | 26.9 | 47.0 | 25.6 | 12.2 |
| 1929 | ² 27.5 | 21.4 | 48.9 | | ³ 10.6 |

GREEN RIVER, TYPE 36

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound |
|------|-------------------------|-----------------------|--------------|---|-------------------------|
| 1923 | 58.9 | 52.2 | 111.1 | 56.4 | 11.0 |
| 1924 | 47.6 | 54.7 | 102.3 | 50.3 | 11.6 |
| 1925 | 51.0 | 52.0 | 103.0 | 51.3 | 6.9 |
| 1926 | 40.0 | 51.7 | 91.7 | 43.3 | 7.4 |
| 1927 | 18.1 | 48.4 | 66.5 | 26.4 | 9.1 |
| 1928 | 18.9 | 40.1 | 59.0 | 28.2 | 11.6 |
| 1929 | ² 28.4 | 30.8 | 59.2 | | ³ 12.0 |

VIRGINIA SUN-CURED, TYPE 37

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound |
|------|-------------------------|-----------------------|--------------|---|-------------------------|
| 1912 | 9.8 | 11.2 | 21.0 | 10.7 | 8.0 |
| 1913 | 12.7 | 10.3 | 23.0 | 9.8 | 8.5 |
| 1914 | 9.1 | 13.2 | 22.3 | 12.8 | 6.5 |
| 1915 | 10.2 | 9.5 | 19.7 | 12.4 | 8.0 |
| 1916 | 8.3 | 7.3 | 15.6 | 10.7 | 14.0 |
| 1917 | 8.8 | 4.9 | 13.7 | 7.4 | 28.5 |
| 1918 | 11.9 | 6.3 | 18.2 | 9.6 | 20.5 |
| 1919 | 6.5 | 8.6 | 15.1 | 5.4 | 28.0 |
| 1920 | 9.0 | 9.7 | 18.7 | 9.2 | 9.2 |
| 1921 | 4.0 | 9.5 | 13.5 | 5.2 | 18.2 |
| 1922 | 8.2 | 8.3 | 16.5 | 8.2 | 14.3 |
| 1923 | 5.6 | 8.3 | 13.9 | 7.6 | 13.2 |
| 1924 | 5.6 | 6.3 | 11.9 | 7.7 | 14.6 |
| 1925 | 5.7 | 4.2 | 9.9 | 5.7 | 16.4 |
| 1926 | 7.2 | 4.2 | 11.4 | 5.5 | 9.4 |
| 1927 | 5.5 | 5.9 | 11.4 | 6.3 | 13.1 |
| 1928 | 5.0 | 5.1 | 10.1 | 4.6 | 10.1 |
| 1929 | ² 5.0 | 5.5 | 10.5 | | ³ 12.0 |

¹ Green weight basis, i. e., farmers sales weight. Disappearance includes consumption, exports, and losses.² Estimated December, 1929.³ Includes Eastern Ohio.

TABLE 172.—*Tobacco: Production, stocks, supply, disappearance, and price, 1912-1929—Continued*PENNSYLVANIA CIGAR LEAF, TYPES 41 AND 53¹

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound |
|-----------|-------------------------|-----------------------|----------------|---|-------------------------|
| | Million pounds | Million pounds | Million pounds | Million pounds | Cents |
| 1912..... | 64.1 | 118.8 | 182.9 | 55.6 | 8.5 |
| 1913..... | 46.7 | 127.3 | 174.0 | 61.0 | 7.5 |
| 1914..... | 48.0 | 113.0 | 161.0 | 55.5 | 7.5 |
| 1915..... | 12.4 | 105.5 | 147.9 | 68.6 | 9.2 |
| 1916..... | 49.1 | 79.3 | 128.4 | 51.9 | 14.2 |
| 1917..... | 58.1 | 76.5 | 134.6 | 49.5 | 21.0 |
| 1918..... | 64.8 | 85.1 | 149.9 | 58.2 | 14.0 |
| 1919..... | 56.8 | 91.7 | 148.5 | 60.7 | 18.0 |
| 1920..... | 64.9 | 87.8 | 152.7 | 69.6 | 12.0 |
| 1921..... | 61.3 | 83.1 | 144.4 | 54.1 | 14.4 |
| 1922..... | 56.8 | 90.3 | 147.1 | 48.0 | 16.0 |
| 1923..... | 59.0 | 99.1 | 158.1 | 48.4 | 18.1 |
| 1924..... | 57.5 | 109.7 | 167.2 | 53.8 | 15.7 |
| 1925..... | 57.4 | 113.4 | 170.8 | 65.5 | 10.4 |
| 1926..... | 43.6 | 105.3 | 148.9 | 64.8 | 10.5 |
| 1927..... | 46.2 | 84.1 | 130.3 | 45.7 | 13.0 |
| 1928..... | 49.6 | 84.6 | 134.2 | 49.9 | 14.0 |
| 1929..... | ² 47.6 | 84.3 | 131.9 | ----- | ³ 17.9 |

OHIO CIGAR LEAF (MIAMI VALLEY), TYPES 42-44

| | | | | | |
|-----------|-------------------|------|-------|-------|-------------------|
| 1912..... | 53.5 | 89.6 | 143.1 | 59.0 | 8.0 |
| 1913..... | 37.4 | 84.1 | 121.5 | 53.0 | 11.0 |
| 1914..... | 64.1 | 68.5 | 122.6 | 48.3 | 9.1 |
| 1915..... | 54.3 | 74.3 | 128.6 | 68.7 | 9.0 |
| 1916..... | 58.2 | 59.9 | 118.1 | 53.7 | 12.0 |
| 1917..... | 61.7 | 64.4 | 126.1 | 59.4 | 24.0 |
| 1918..... | 53.0 | 66.7 | 119.7 | 50.4 | 16.0 |
| 1919..... | 41.4 | 69.3 | 110.7 | 30.9 | 20.0 |
| 1920..... | 37.3 | 79.8 | 117.1 | 38.8 | 16.0 |
| 1921..... | 28.8 | 78.3 | 107.1 | 33.1 | 13.0 |
| 1922..... | 26.7 | 74.0 | 100.7 | 26.6 | 13.9 |
| 1923..... | 25.9 | 74.1 | 100.0 | 26.3 | 13.0 |
| 1924..... | 25.4 | 73.7 | 99.1 | 42.7 | 13.0 |
| 1925..... | 39.1 | 56.4 | 95.5 | 23.8 | 11.4 |
| 1926..... | 23.3 | 71.7 | 95.0 | 38.2 | 8.5 |
| 1927..... | 16.6 | 56.8 | 73.4 | 26.5 | 15.6 |
| 1928..... | 20.1 | 46.9 | 67.0 | 27.1 | 17.5 |
| 1929..... | ³ 22.3 | 39.9 | 62.2 | ----- | ³ 16.5 |

NEW ENGLAND BROADLEAF, TYPE 51

| | | | | | |
|-----------|-------------------|------|------|-------|-------------------|
| 1922..... | 14.4 | 31.8 | 46.2 | 12.5 | 30.0 |
| 1923..... | 20.2 | 33.7 | 53.9 | 14.1 | 29.0 |
| 1924..... | 22.8 | 39.8 | 62.6 | 17.9 | 20.0 |
| 1925..... | 25.3 | 44.7 | 70.0 | 26.2 | 18.9 |
| 1926..... | 17.5 | 43.8 | 61.3 | 23.6 | 25.0 |
| 1927..... | 15.0 | 37.7 | 52.7 | 21.3 | 21.0 |
| 1928..... | 14.2 | 31.4 | 45.6 | 14.6 | 21.0 |
| 1929..... | ³ 10.4 | 31.0 | 41.4 | ----- | ³ 30.2 |

NEW ENGLAND HAVANA SEED, TYPES 52 AND 65

| Year | Production ¹ | | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound | |
|-----------|-------------------------|-------------------|-----------------------|----------------|---|-------------------------|-------------------|
| | Primes Havana seed | Havana seed | | | | Primes Havana seed | Havana seed |
| | Million pounds | Million pounds | Million pounds | Million pounds | Million pounds | Cents | Cents |
| 1922..... | 1.4 | 16.4 | 34.8 | 52.6 | 12.6 | 30.0 | 29.3 |
| 1923..... | 1.1 | 22.1 | 40.0 | 63.2 | 18.4 | 26.0 | 26.0 |
| 1924..... | 1.0 | 20.4 | 44.8 | 66.2 | 17.3 | 23.0 | 19.0 |
| 1925..... | .5 | 20.1 | 48.9 | 69.5 | 21.0 | 21.0 | 16.1 |
| 1926..... | .5 | 15.5 | 48.5 | 64.5 | 22.1 | 35.0 | 26.0 |
| 1927..... | .7 | 15.6 | 42.4 | 58.7 | 21.8 | 30.0 | 23.4 |
| 1928..... | .6 | 17.5 | 36.9 | 55.0 | 23.6 | 30.0 | 24.0 |
| 1929..... | ³ .3 | ³ 18.0 | 31.4 | 49.7 | ----- | ³ 35.2 | ³ 34.5 |

¹ Green weight basis, i. e., farmers' sales weight. Disappearance includes consumption, exports, and losses.² Estimated December, 1929.³ Includes New York Havana seed.

STATISTICS OF COTTON, SUGAR, AND TOBACCO

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TABLE 172.—*Tobacco: Production, stocks, supply, disappearance, and price, 1912-1929—Continued*

WISCONSIN CIGAR LEAF, TYPES 54 AND 55

| Year | Production ¹ | Stocks on hand Oct. 1 | Total supply | Disappearance, year beginning Oct. 1 ¹ | Average price per pound |
|-----------|-------------------------|-----------------------|----------------|---|-------------------------|
| | Million pounds | Million pounds | Million pounds | Million pounds | Cents |
| 1912..... | 54.4 | 71.2 | 125.6 | 53.5 | 11.0 |
| 1913..... | 50.7 | 72.1 | 122.8 | 51.5 | 12.0 |
| 1914..... | 50.8 | 71.3 | 125.1 | 46.2 | 7.5 |
| 1915..... | 36.9 | 78.9 | 115.8 | 56.0 | 6.0 |
| 1916..... | 55.8 | 59.8 | 115.6 | 62.5 | 12.5 |
| 1917..... | 44.5 | 53.1 | 97.6 | 46.8 | 17.5 |
| 1918..... | 65.2 | 50.8 | 116.0 | 47.3 | 22.0 |
| 1919..... | 61.0 | 68.7 | 129.7 | 44.4 | 23.5 |
| 1920..... | 62.4 | 85.3 | 147.7 | 54.2 | 13.9 |
| 1921..... | 61.5 | 93.5 | 155.0 | 49.0 | 12.5 |
| 1922..... | 45.6 | 120.6 | 166.2 | 40.0 | 13.5 |
| 1923..... | 48.1 | 117.2 | 165.3 | 55.3 | 12.0 |
| 1924..... | 35.7 | 110.0 | 145.7 | 47.5 | 6.0 |
| 1925..... | 44.0 | 98.2 | 142.2 | 49.0 | 13.8 |
| 1926..... | 33.4 | 93.2 | 126.6 | 43.5 | 13.8 |
| 1927..... | 33.2 | 83.1 | 116.3 | 43.8 | 16.0 |
| 1928..... | 49.3 | 72.5 | 121.8 | 35.1 | 14.5 |
| 1929..... | ³ 46.9 | 86.7 | 133.6 | ----- | ³ 16.0 |

Bureau of Agricultural Economics; stocks prior to 1929 compiled from reports of the Bureau of the Census.

¹ Green weight basis, i. e., farmers' sales weight. Disappearance includes consumption, exports, and losses.

³ Estimated December, 1929.

TABLE 173.—*Tobacco: Stocks in hands of dealers and manufacturers, first of each quarter, 1912-1929*

FLUE CURED TYPES 11, 12, 13, 14

| | Jan. 1 | Apr. 1 | July 1 | Oct. 1 | | Jan. 1 | Apr. 1 | July 1 | Oct. 1 |
|-----------|--------------|--------------|--------------|--------------|-----------|--------------|--------------|--------------|--------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1912..... | ----- | ----- | ----- | 237, 189 | 1921..... | 523, 913 | 571, 148 | 483, 109 | 482, 740 |
| 1913..... | ----- | 254, 160 | ----- | 227, 987 | 1922..... | 570, 154 | 516, 494 | 440, 697 | 446, 257 |
| 1914..... | ----- | 282, 341 | ----- | 238, 372 | 1923..... | 544, 405 | 490, 426 | 438, 667 | 463, 077 |
| 1915..... | ----- | 335, 725 | ----- | 276, 772 | 1924..... | 619, 840 | 582, 562 | 476, 626 | 510, 020 |
| 1916..... | ----- | 358, 238 | ----- | 268, 130 | 1925..... | 579, 462 | 543, 605 | 462, 311 | 513, 171 |
| 1917..... | 332, 460 | 297, 701 | 253, 436 | 349, 936 | 1926..... | 603, 090 | 548, 476 | 455, 371 | 492, 984 |
| 1918..... | 428, 914 | 397, 511 | 292, 357 | 341, 500 | 1927..... | 628, 574 | 556, 787 | 466, 476 | 580, 070 |
| 1919..... | 427, 370 | 434, 517 | 327, 277 | 367, 977 | 1928..... | 756, 535 | 678, 958 | 564, 989 | 661, 817 |
| 1920..... | 448, 542 | 415, 332 | 304, 206 | 229, 703 | 1929..... | 766, 370 | 703, 396 | 589, 978 | ----- |

VIRGINIA FIRE CURED, TYPE 21

| | | | | | | | | | |
|-----------|---------|---------|---------|---------|-----------|---------|---------|---------|---------|
| 1912..... | ----- | ----- | ----- | 34, 593 | 1921..... | 32, 493 | 50, 180 | 41, 679 | 34, 615 |
| 1913..... | ----- | 53, 837 | ----- | 33, 730 | 1922..... | 36, 527 | 39, 182 | 31, 429 | 24, 671 |
| 1914..... | ----- | 54, 046 | ----- | 34, 248 | 1923..... | 23, 258 | 44, 806 | 34, 523 | 26, 971 |
| 1915..... | ----- | 51, 244 | ----- | 28, 656 | 1924..... | 32, 677 | 41, 520 | 37, 828 | 34, 155 |
| 1916..... | ----- | 57, 562 | ----- | 38, 756 | 1925..... | 34, 453 | 55, 933 | 49, 468 | 43, 069 |
| 1917..... | 46, 348 | 55, 027 | 48, 365 | 45, 236 | 1926..... | 52, 242 | 64, 136 | 57, 707 | 49, 924 |
| 1918..... | 45, 123 | 56, 571 | 43, 631 | 41, 810 | 1927..... | 53, 065 | 73, 510 | 65, 052 | 56, 146 |
| 1919..... | 46, 472 | 59, 591 | 42, 919 | 34, 221 | 1928..... | 57, 000 | 64, 931 | 59, 409 | 49, 040 |
| 1920..... | 37, 715 | 48, 531 | 34, 972 | 30, 809 | 1929..... | 47, 633 | 49, 092 | ----- | ----- |

KENTUCKY AND TENNESSEE FIRE CURED, TYPES 22 AND 23

| | | | | | | | | | |
|-----------|----------|----------|----------|----------|-----------|----------|----------|----------|----------|
| 1912..... | ----- | ----- | ----- | 91, 067 | 1921..... | 138, 166 | 178, 847 | 190, 673 | 155, 731 |
| 1913..... | ----- | 142, 932 | ----- | 111, 639 | 1922..... | 132, 099 | 202, 046 | 179, 415 | 130, 159 |
| 1914..... | ----- | 170, 831 | ----- | 141, 793 | 1923..... | 100, 148 | 168, 571 | 185, 349 | 140, 869 |
| 1915..... | ----- | 158, 725 | ----- | 149, 834 | 1924..... | 113, 753 | 160, 122 | 190, 312 | 143, 446 |
| 1916..... | ----- | 148, 133 | ----- | 122, 368 | 1925..... | 118, 557 | 197, 605 | 192, 687 | 151, 189 |
| 1917..... | 97, 056 | 219, 286 | 210, 024 | 128, 011 | 1926..... | 141, 311 | 183, 733 | 194, 054 | 169, 250 |
| 1918..... | 117, 118 | 144, 957 | 222, 948 | 197, 107 | 1927..... | 132, 340 | 198, 465 | 186, 791 | 161, 939 |
| 1919..... | 158, 036 | 219, 181 | 203, 462 | 141, 978 | 1928..... | 150, 328 | 168, 012 | 143, 883 | 114, 120 |
| 1920..... | 118, 800 | 206, 428 | 200, 984 | 179, 253 | 1929..... | 105, 902 | 140, 420 | 133, 719 | ----- |

TABLE 173.—*Tobacco: Stocks in hands of dealers and manufacturers, first of each quarter, 1912-1929—Continued*

HENDERSON FIRE CURED (HENDERSON STEMMING), TYPE 24

| | Jan. 1 | Apr. 1 | July 1 | Oct. 1 | | Jan. 1 | Apr. 1 | July 1 | Oct. 1 |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1912----- | | | | 1,023 | 1921----- | 9,815 | 13,479 | 11,376 | 7,680 |
| 1913----- | | 13,210 | | 7,818 | 1922----- | 8,175 | 13,695 | 7,370 | 3,892 |
| 1914----- | | 9,199 | | 1,980 | 1923----- | 5,340 | 13,236 | 8,567 | 3,020 |
| 1915----- | | 11,788 | | 2,424 | 1924----- | 4,083 | 11,627 | 5,961 | 3,812 |
| 1916----- | | 12,087 | | 4,649 | 1925----- | 5,138 | 13,595 | 8,472 | 5,837 |
| 1917----- | 5,230 | 19,008 | 18,432 | 16,423 | 1926----- | 7,639 | 13,785 | 10,060 | 7,301 |
| 1918----- | 15,481 | 25,387 | 32,138 | 22,886 | 1927----- | 6,145 | 11,190 | 9,987 | 7,242 |
| 1919----- | 20,112 | 26,232 | 17,592 | 7,532 | 1928----- | 7,094 | 8,390 | 5,314 | 4,583 |
| 1920----- | 5,899 | 17,023 | 17,847 | 12,132 | 1929----- | 3,446 | 2,850 | 1,288 | ----- |

BURLEY, TYPE 31

| | | | | | | | | | |
|-----------|---------|---------|---------|---------|-----------|---------|---------|---------|---------|
| 1912----- | | | | 215,307 | 1921----- | 237,777 | 399,002 | 371,662 | 324,351 |
| 1913----- | | 327,078 | | 225,190 | 1922----- | 293,606 | 395,027 | 341,425 | 280,856 |
| 1914----- | | 311,289 | | 203,672 | 1923----- | 282,731 | 463,014 | 404,989 | 342,885 |
| 1915----- | | 343,739 | | 249,804 | 1924----- | 334,126 | 542,409 | 482,201 | 428,332 |
| 1916----- | | 319,436 | | 190,321 | 1925----- | 405,643 | 562,769 | 498,045 | 459,087 |
| 1917----- | 188,158 | 323,191 | 274,031 | 207,594 | 1926----- | 462,805 | 578,298 | 524,215 | 466,037 |
| 1918----- | 177,207 | 306,637 | 247,505 | 190,137 | 1927----- | 469,811 | 586,337 | 518,363 | 451,251 |
| 1919----- | 139,039 | 333,912 | 287,565 | 229,891 | 1928----- | 438,267 | 475,508 | 411,065 | 347,827 |
| 1920----- | 227,279 | 328,136 | 320,218 | 267,789 | 1929----- | 354,772 | 465,941 | 396,541 | ----- |

SOUTHERN MARYLAND, TYPE 32

| | | | | | | | | | |
|-----------|--------|--------|--------|--------|-----------|--------|--------|--------|--------|
| 1912----- | | | | 6,644 | 1921----- | 16,549 | 14,487 | 12,435 | 19,405 |
| 1913----- | | 3,946 | | 6,773 | 1922----- | 14,127 | 12,528 | 11,371 | 16,944 |
| 1914----- | | 4,064 | | 7,836 | 1923----- | 10,673 | 6,080 | 5,019 | 12,575 |
| 1915----- | | 9,877 | | 17,629 | 1924----- | 6,842 | 4,780 | 7,741 | 15,232 |
| 1916----- | | 6,457 | | 10,644 | 1925----- | 11,457 | 9,072 | 8,758 | 16,678 |
| 1917----- | 8,689 | 9,050 | 11,092 | 18,227 | 1926----- | 14,983 | 9,876 | 8,203 | 19,349 |
| 1918----- | 18,445 | 15,259 | 14,249 | 19,369 | 1927----- | 18,699 | 12,447 | 12,523 | 21,899 |
| 1919----- | 18,627 | 17,317 | 14,586 | 21,571 | 1928----- | 15,314 | 10,848 | 12,104 | 25,132 |
| 1920----- | 21,256 | 16,849 | 10,050 | 18,478 | 1929----- | 20,245 | 13,134 | 13,203 | ----- |

ONE SUCKER, TYPE 35

| | | | | | | | | | |
|-----------|--------|--------|--------|--------|-----------|--------|--------|--------|--------|
| 1912----- | | | | 22,586 | 1921----- | 41,620 | 56,165 | 52,761 | 47,635 |
| 1913----- | | 36,983 | | 31,866 | 1922----- | 52,435 | 52,310 | 45,938 | 36,354 |
| 1914----- | | 44,193 | | 27,842 | 1923----- | 43,584 | 56,226 | 42,135 | 33,804 |
| 1915----- | | 37,294 | | 22,260 | 1924----- | 41,413 | 64,360 | 55,202 | 41,764 |
| 1916----- | | 29,690 | | 16,702 | 1925----- | 43,342 | 59,207 | 52,535 | 42,429 |
| 1917----- | 30,139 | 44,117 | 30,527 | 18,562 | 1926----- | 43,275 | 63,291 | 57,136 | 49,924 |
| 1918----- | 29,101 | 47,317 | 49,373 | 35,901 | 1927----- | 46,601 | 59,143 | 48,245 | 41,668 |
| 1919----- | 34,318 | 73,834 | 45,835 | 32,520 | 1928----- | 38,813 | 39,815 | 32,399 | 26,882 |
| 1920----- | 41,834 | 64,318 | 46,984 | 44,589 | 1929----- | 28,067 | 37,066 | 26,496 | ----- |

GREEN RIVER, TYPE 36

| | | | | | | | | | |
|-----------|--------|--------|--------|--------|-----------|--------|--------|--------|--------|
| 1912----- | | | | 42,876 | 1921----- | 46,318 | 58,795 | 50,213 | 45,015 |
| 1913----- | | 64,999 | | 50,389 | 1922----- | 50,525 | 54,479 | 45,806 | 39,110 |
| 1914----- | | 59,656 | | 48,156 | 1923----- | 45,099 | 70,227 | 64,041 | 52,243 |
| 1915----- | | 58,389 | | 45,193 | 1924----- | 55,742 | 67,571 | 62,121 | 54,676 |
| 1916----- | | 55,266 | | 34,344 | 1925----- | 56,169 | 70,726 | 57,139 | 51,955 |
| 1917----- | 38,926 | 65,321 | 58,947 | 49,484 | 1926----- | 52,681 | 61,867 | 57,908 | 51,711 |
| 1918----- | 53,509 | 73,021 | 74,038 | 59,960 | 1927----- | 54,161 | 63,115 | 54,683 | 48,447 |
| 1919----- | 55,413 | 74,781 | 55,444 | 40,469 | 1928----- | 47,878 | 49,127 | 43,722 | 40,127 |
| 1920----- | 44,024 | 65,618 | 61,105 | 47,212 | 1929----- | 41,122 | 35,908 | 35,670 | ----- |

VIRGINIA SUN CURED, TYPE 37

| | | | | | | | | | |
|-----------|-------|--------|--------|--------|-----------|--------|--------|-------|-------|
| 1912----- | | | | 11,157 | 1921----- | 7,172 | 10,071 | 9,812 | 9,467 |
| 1913----- | | 13,098 | | 10,252 | 1922----- | 10,146 | 10,637 | 9,844 | 8,282 |
| 1914----- | | 12,725 | | 13,206 | 1923----- | 8,426 | 10,371 | 9,298 | 8,307 |
| 1915----- | | 13,055 | | 9,465 | 1924----- | 8,787 | 8,581 | 7,005 | 6,255 |
| 1916----- | | 11,758 | | 7,286 | 1925----- | 5,739 | 6,709 | 5,503 | 4,172 |
| 1917----- | 8,907 | 9,169 | 7,158 | 4,863 | 1926----- | 4,771 | 6,059 | 5,319 | 4,243 |
| 1918----- | 5,712 | 7,427 | 7,939 | 6,320 | 1927----- | 5,482 | 7,966 | 7,236 | 5,925 |
| 1919----- | 8,091 | 10,480 | 10,087 | 8,592 | 1928----- | 6,504 | 7,558 | 6,347 | 5,052 |
| 1920----- | 9,258 | 9,238 | 8,320 | 9,679 | 1929----- | 4,422 | 7,915 | 6,073 | ----- |

TABLE 173.—*Tobacco: Stocks in hands of dealers and manufacturers, first of each quarter, 1912-1929—Continued*

PENNSYLVANIA CIGAR LEAF, TYPES 41 AND 53

| | Jan. 1 | Apr. 1 | July 1 | Oct. 1 | | Jan. 1 | Apr. 1 | July 1 | Oct. 1 |
|------|-----------------|-----------------|-----------------|-----------------|------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1912 | | | | 118,782 | 1921 | 69,445 | 93,919 | 93,622 | 83,072 |
| 1913 | | 141,015 | | 127,345 | 1922 | 69,854 | 96,827 | 101,276 | 90,258 |
| 1914 | | 125,606 | | 113,013 | 1923 | 81,375 | 119,621 | 110,387 | 99,080 |
| 1915 | | 127,239 | | 105,460 | 1924 | 87,395 | 127,273 | 120,441 | 109,726 |
| 1916 | | 109,392 | | 79,294 | 1925 | 97,444 | 118,585 | 122,487 | 113,400 |
| 1917 | 69,536 | 90,751 | 87,922 | 76,503 | 1926 | 97,585 | 117,839 | 118,905 | 105,261 |
| 1918 | 62,970 | 99,766 | 96,753 | 85,127 | 1927 | 89,708 | 113,551 | 95,539 | 84,067 |
| 1919 | 75,764 | 94,496 | 99,954 | 91,696 | 1928 | 71,516 | 106,646 | 95,466 | 84,649 |
| 1920 | 80,439 | 105,736 | 98,671 | 87,750 | 1929 | 72,424 | 115,639 | 93,861 | |

OHIO CIGAR LEAF (MIAMI VALLEY), TYPES 42, 43, 44

| 1912 | | | | 89,575 | 1921 | 70,173 | 78,771 | 76,225 | 78,303 |
|------|--------|--------|--------|--------|------|--------|--------|--------|--------|
| 1913 | | 90,327 | | 84,081 | 1922 | 71,414 | 75,579 | 79,182 | 73,974 |
| 1914 | | 82,436 | | 88,521 | 1923 | 64,026 | 85,024 | 81,719 | 74,119 |
| 1915 | | 91,029 | | 74,329 | 1924 | 62,531 | 60,241 | 80,193 | 73,731 |
| 1916 | | 74,191 | | 59,913 | 1925 | 65,612 | 63,296 | 61,024 | 56,381 |
| 1917 | 50,304 | 84,505 | 74,924 | 64,379 | 1926 | 51,650 | 67,024 | 75,003 | 71,094 |
| 1918 | 52,590 | 71,822 | 75,658 | 66,713 | 1927 | 62,490 | 72,037 | 64,386 | 56,774 |
| 1919 | 61,023 | 56,282 | 62,094 | 69,305 | 1928 | 48,420 | 60,696 | 55,515 | 46,875 |
| 1920 | 71,550 | 64,602 | 79,350 | 79,763 | 1929 | 38,868 | 55,392 | 49,686 | |

GEORGIA-FLORIDA CIGAR LEAF—SUN AND SHADE, TYPES 45 AND 62

| 1912 | | | | 7,677 | 1921 | 7,944 | 6,853 | 5,544 | 8,312 |
|------|-------|-------|-------|--------|------|-------|-------|-------|-------|
| 1913 | | 6,231 | | 8,352 | 1922 | 9,499 | 7,389 | 6,697 | 8,139 |
| 1914 | | 6,472 | | 10,549 | 1923 | 7,586 | 6,384 | 5,199 | 7,302 |
| 1915 | | 6,461 | | 8,515 | 1924 | 8,415 | 7,140 | 6,149 | 6,604 |
| 1916 | | 6,645 | | 7,697 | 1925 | 7,206 | 5,931 | 4,759 | 5,308 |
| 1917 | 6,568 | 5,459 | 4,371 | 6,358 | 1926 | 4,364 | 4,077 | 3,431 | 4,957 |
| 1918 | 5,213 | 5,367 | 4,778 | 6,741 | 1927 | 4,088 | 3,190 | 1,876 | 4,879 |
| 1919 | 7,166 | 5,818 | 4,805 | 6,010 | 1928 | 4,461 | 4,019 | 2,618 | 7,081 |
| 1920 | 6,281 | 5,914 | 4,760 | 6,569 | 1929 | 5,994 | | | |

PORTO RICO CIGAR LEAF, TYPE 46

| 1912 | | | | 2,942 | 1921 | 9,541 | 9,116 | 7,866 | 7,698 |
|------|--------|-------|-------|--------|------|--------|--------|--------|--------|
| 1913 | | 3,814 | | 4,128 | 1922 | 9,408 | 9,499 | 8,858 | 10,873 |
| 1914 | | 4,384 | | 4,874 | 1923 | 11,331 | 9,446 | 6,519 | 9,546 |
| 1915 | | 6,935 | | 5,889 | 1924 | 11,673 | 11,116 | 8,773 | 9,221 |
| 1916 | | 4,684 | | 4,781 | 1925 | 10,455 | 10,130 | 8,350 | 8,074 |
| 1917 | 4,567 | 3,494 | 2,480 | 4,843 | 1926 | 11,270 | 10,194 | 7,651 | 10,719 |
| 1918 | 7,308 | 7,297 | 6,432 | 7,669 | 1927 | 18,577 | 17,639 | 13,746 | 16,588 |
| 1919 | 10,023 | 9,137 | 8,119 | 11,115 | 1928 | 21,426 | 23,646 | 21,172 | 20,067 |
| 1920 | 10,833 | 8,874 | 7,419 | 8,746 | 1929 | 22,230 | | | |

NEW ENGLAND BROAD LEAF, TYPE 51

| 1912 | | | | | 1921 | 26,726 | 31,956 | 31,720 | 29,982 |
|------|--------|--------|--------|--------|------|--------|--------|--------|--------|
| 1913 | | | | | 1922 | 26,142 | 27,159 | 33,560 | 31,761 |
| 1914 | | | | 31,496 | 1923 | 30,997 | 36,840 | 38,504 | 33,690 |
| 1915 | | 30,538 | | 31,218 | 1924 | 30,386 | 39,737 | 45,588 | 39,827 |
| 1916 | | 33,689 | | 29,884 | 1925 | 36,294 | 43,978 | 49,382 | 44,712 |
| 1917 | 26,277 | 28,620 | 30,253 | 25,397 | 1926 | 41,758 | 47,857 | 49,197 | 43,774 |
| 1918 | 21,671 | 26,476 | 27,373 | 23,344 | 1927 | 40,278 | 46,483 | 45,925 | 37,709 |
| 1919 | 21,133 | 24,165 | 27,749 | 24,073 | 1928 | 32,827 | 38,915 | 32,205 | 31,441 |
| 1920 | 22,136 | 27,530 | 32,026 | 27,538 | 1929 | 28,102 | 37,880 | | |

NEW ENGLAND HAVANA SEED, TYPE 52

| 1912 | | | | | 1921 | 26,850 | 33,872 | 29,969 | 26,043 |
|------|--------|--------|--------|--------|------|--------|--------|--------|--------|
| 1913 | | | | | 1922 | 31,389 | 39,735 | 39,008 | 34,821 |
| 1914 | | | | 17,480 | 1923 | 35,337 | 44,817 | 43,804 | 39,952 |
| 1915 | | 27,853 | | 24,359 | 1924 | 41,780 | 53,685 | 50,194 | 44,791 |
| 1916 | | 31,438 | | 22,732 | 1925 | 40,944 | 58,544 | 53,578 | 48,862 |
| 1917 | 21,849 | 29,515 | 30,797 | 25,819 | 1926 | 49,739 | 56,864 | 52,955 | 48,471 |
| 1918 | 26,262 | 34,116 | 31,521 | 26,662 | 1927 | 43,524 | 49,565 | 44,582 | 42,408 |
| 1919 | 26,062 | 31,970 | 31,322 | 23,831 | 1928 | 40,889 | 45,376 | 46,066 | 36,905 |
| 1920 | 26,407 | 33,538 | 35,087 | 28,262 | 1929 | 38,076 | 39,940 | | |

TABLE 173.—*Tobacco: Stocks in hands of dealers and manufacturers, first of each quarter, 1912-1929—Continued*

NEW YORK HAVANA SEED, TYPE 53

| | Jan. 1 | Apr. 1 | July 1 | Oct. 1 | | Jan. 1 | Apr. 1 | July 1 | Oct. 1 |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1912..... | | | | 5,239 | 1921..... | 2,647 | 4,487 | 4,022 | 3,547 |
| 1913..... | | 5,853 | | 4,989 | 1922..... | 3,554 | 5,740 | 4,985 | 4,535 |
| 1914..... | | 6,053 | | 3,721 | 1923..... | 3,628 | 4,235 | 3,982 | 3,302 |
| 1915..... | | 5,475 | | 4,250 | 1924..... | 3,289 | 4,098 | 3,524 | 3,183 |
| 1916..... | | 6,305 | | 3,989 | 1925..... | 2,859 | 4,159 | 4,393 | 4,438 |
| 1917..... | 3,065 | 3,634 | 2,882 | 3,089 | 1926..... | 3,991 | 5,284 | 4,974 | 4,577 |
| 1918..... | 2,558 | 3,446 | 3,123 | 2,654 | 1927..... | 3,783 | 4,425 | 3,509 | 3,196 |
| 1919..... | 2,588 | 3,607 | 3,018 | 2,343 | 1928..... | 2,673 | 2,601 | 2,608 | 2,279 |
| 1920..... | 2,703 | 3,114 | 3,376 | 2,479 | 1929..... | 2,054 | | | |

WISCONSIN CIGAR LEAF, TYPES 54 AND 55

| | | | | | | | | | |
|-----------|--------|--------|--------|--------|-----------|---------|---------|---------|---------|
| 1912..... | | | | 71,157 | 1921..... | 77,181 | 102,405 | 103,535 | 93,475 |
| 1913..... | | 93,764 | | 72,088 | 1922..... | 82,767 | 130,690 | 132,009 | 120,573 |
| 1914..... | | 85,741 | | 71,334 | 1923..... | 102,653 | 125,742 | 126,919 | 117,166 |
| 1915..... | | 88,662 | | 78,891 | 1924..... | 99,798 | 105,828 | 116,353 | 110,005 |
| 1916..... | | 86,796 | | 59,783 | 1925..... | 97,749 | 107,438 | 110,344 | 98,223 |
| 1917..... | 46,473 | 62,592 | 66,877 | 53,051 | 1926..... | 83,895 | 114,828 | 105,421 | 93,205 |
| 1918..... | 40,714 | 64,917 | 65,207 | 50,784 | 1927..... | 82,781 | 107,151 | 96,658 | 83,058 |
| 1919..... | 44,411 | 72,145 | 79,407 | 68,713 | 1928..... | 69,925 | 94,135 | 84,924 | 72,543 |
| 1920..... | 54,758 | 71,221 | 84,292 | 85,344 | 1929..... | 62,359 | 97,345 | 97,380 | |

NEW ENGLAND SHADE GROWN, TYPE 61

| | | | | | | | | | |
|-----------|-------|-------|-------|-------|-----------|--------|--------|--------|-------|
| 1912..... | | | | | 1921..... | 6,793 | 6,314 | 6,452 | 7,654 |
| 1913..... | | | | | 1922..... | 9,087 | 8,811 | 7,706 | 7, |
| 1914..... | | | | 1,226 | 1923..... | 9,487 | 9,255 | 7,644 | 9, |
| 1915..... | | 2,305 | | 2,195 | 1924..... | 12,630 | 11,479 | 11,174 | 9, |
| 1916..... | | 2,605 | | 1,913 | 1925..... | 12,181 | 10,639 | 9,493 | 10, |
| 1917..... | 2,477 | 3,463 | 3,582 | 2,833 | 1926..... | 11,734 | 9,430 | 6,840 | 6, |
| 1918..... | 3,790 | 6,281 | 4,825 | 4,594 | 1927..... | 8,659 | 7,606 | 6,494 | 6, |
| 1919..... | 5,757 | 6,280 | 6,839 | 5,727 | 1928..... | 8,363 | 7,878 | 5,878 | 6, |
| 1920..... | 7,990 | 8,019 | 5,492 | 5,218 | 1929..... | 8,722 | 8,749 | | |

MISCELLANEOUS¹—EASTERN OHIO EXPORT

| | | | | | | | | | |
|-----------|-------|-------|-------|-------|-----------|-------|--------|--------|-------|
| 1912..... | | | | 2,709 | 1921..... | 7,565 | 11,015 | 11,206 | 9,356 |
| 1913..... | | 3,006 | | 702 | 1922..... | 6,865 | 6,630 | 6,078 | 6,536 |
| 1914..... | | 2,473 | | 1,769 | 1923..... | 4,206 | 4,506 | 3,577 | 2,986 |
| 1915..... | | 3,206 | | 4,199 | 1924..... | 2,260 | 2,283 | 2,080 | 2,029 |
| 1916..... | | 2,750 | | 1,890 | 1925..... | 1,809 | 2,667 | 2,482 | 1,519 |
| 1917..... | 1,813 | 1,947 | 2,081 | 1,939 | 1926..... | 1,553 | 1,812 | 1,609 | 1,185 |
| 1918..... | 2,521 | 3,742 | 5,149 | 4,985 | 1927..... | 1,375 | 1,520 | 1,501 | 946 |
| 1919..... | 5,557 | 5,575 | 7,092 | 6,644 | 1928..... | 1,501 | 1,673 | 1,415 | 985 |
| 1920..... | 7,837 | 8,040 | 8,256 | 9,135 | 1929..... | 1,614 | | | |

Bureau of Agricultural Economics.

¹ Not including small quantities of other miscellaneous, e. g., Louisiana perique.TABLE 174.—*Tobacco: Exports, by types, 1923-1928*

| Year beginning Oct. 1 | Flue-cured, types 11-14 ¹ | Virginia flue-cured, type 21 | Ken- tucky and Ten- nessee flue-cured, types 22 and 23 | Burley, type 31 | Southern Mary- land, ² type 32 | Green River, type 36 |
|-----------------------|--|------------------------------------|--|--------------------|--|----------------------------|
| | Million pounds | Million pounds | Million pounds | Million pounds | Million pounds | Million pounds |
| 1923..... | 266.0 | 27.4 | 167.1 | 7.7 | 19.2 | 16.2 |
| 1924..... | 207.5 | 25.7 | 125.3 | 6.0 | 13.7 | 16.8 |
| 1925..... | 324.4 | 19.3 | 110.0 | 5.8 | 12.3 | 14.4 |
| 1926..... | 288.7 | 22.0 | 128.4 | 18.1 | 18.8 | 14.2 |
| 1927..... | 328.9 | 21.2 | 84.7 | 7.1 | 12.6 | 8.1 |
| 1928..... | 414.4 | 18.1 | 75.4 | 6.1 | 13.1 | 9.9 |

Bureau of Agricultural Economics. Compiled from reports of the Bureau of Foreign and Domestic Commerce.

¹ Year beginning July 1.² Includes eastern Ohio.

TABLE 175.—*Tobacco, unmanufactured: International trade, average 1909-1913, annual 1925-1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|-------------------------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------|--------------|
| | Average 1909-1913 | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Im-ports | Ex-ports | Imports | Exports | Imports | Exports | Imports | Exports | Im-ports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| United States..... | 52,768 | 381,127 | 77,690 | 477,488 | 67,906 | 487,058 | 102,754 | 511,868 | 74,797 | 583,850 |
| Dutch East Indies..... | 8,074 | 161,265 | 6,148 | 202,646 | 10,798 | 162,728 | 14,413 | 169,563 | 11,262 | 115,677 |
| Brazil..... | 620 | 60,164 | 3,260 | 76,830 | 3,624 | 61,044 | 0 | 59,391 | 0 | 65,274 |
| Bulgaria..... | 0 | 4,310 | 0 | 74,179 | 0 | 60,546 | 0 | 0 | 0 | 49,381 |
| Philippine Islands..... | 45 | 26,018 | 531 | 38,420 | 785 | 33,164 | 732 | 53,912 | 816 | 49,371 |
| Greece..... | 12,024 | 18,113 | 72 | 91,952 | 0 | 120,552 | 0 | 116,231 | 0 | 107,812 |
| British India..... | 6,538 | 28,874 | 14,431 | 40,865 | 16,197 | 42,095 | 16,395 | 39,401 | 16,560 | 42,167 |
| Dominican Republic..... | 0 | 22,395 | 0 | 49,075 | 0 | 21,504 | 0 | 44,750 | 0 | 31,014 |
| Cuba..... | 141 | 37,743 | 0 | 33,628 | 0 | 40,234 | 0 | 19,602 | 0 | 0 |
| Algeria..... | 4,776 | 11,681 | 6,094 | 24,625 | 9,945 | 39,668 | 11,106 | 28,696 | 11,523 | 40,474 |
| Paraguay..... | 0 | 11,361 | 0 | 18,883 | 0 | 10,920 | 0 | 10,138 | 0 | 0 |
| Russia..... | 1,084 | 23,283 | 0 | 2,672 | 0 | 6,281 | 0 | 7,582 | 0 | 12,670 |
| Hungary..... | 0 | 0 | 4,602 | 4,664 | 10,433 | 3,240 | 7,886 | 8,757 | 7,523 | 15,185 |
| Ceylon..... | 0 | 4,093 | 2 | 2,852 | 3 | 1,973 | 14 | 1,554 | 0 | 1,643 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| Germany..... | 168,437 | 116 | 270,225 | 578 | 135,346 | 672 | 210,918 | 545 | 244,290 | 683 |
| Netherlands..... | 57,218 | 3,786 | 67,603 | 3,230 | 70,952 | 3,322 | 68,159 | 3,473 | 71,297 | 3,081 |
| United Kingdom..... | 117,956 | 4,603 | 176,598 | 5,011 | 186,190 | 3,853 | 212,538 | 8,166 | 208,741 | 10,448 |
| Poland..... | 0 | 0 | 49,042 | 31 | 27,434 | 2,487 | 33,663 | 506 | 22,568 | 335 |
| France..... | 63,914 | 26 | 119,014 | 551 | 98,090 | 695 | 91,108 | 141 | 67,756 | 510 |
| Spain..... | 51,026 | 0 | 56,448 | 0 | 25,758 | 0 | 51,826 | 0 | 0 | 0 |
| China..... | 15,113 | 25,487 | 73,558 | 27,495 | 100,678 | 28,969 | 84,400 | 30,338 | 0 | 0 |
| Belgium..... | 22,094 | 33 | 43,471 | 105 | 41,934 | 49 | 45,450 | 71 | 45,717 | 84 |
| Czechoslovakia..... | 0 | 0 | 45,622 | 0 | 41,524 | 28 | 37,626 | 0 | 24,919 | 7 |
| Italy..... | 47,732 | 3,008 | 25,609 | 6,980 | 12,970 | 7,033 | 12,383 | 5,295 | 13,334 | 7,214 |
| Austria..... | 49,984 | 23,192 | 25,682 | 1,392 | 20,235 | 737 | 40,034 | 1,983 | 33,024 | 2,490 |
| Argentina..... | 14,988 | 41 | 20,131 | 279 | 24,137 | 366 | 23,314 | 588 | 0 | 0 |
| Egypt..... | 19,005 | 0 | 16,709 | 0 | 16,370 | 0 | 15,929 | 0 | 17,117 | 0 |
| Norway..... | 3,994 | 0 | 4,360 | 0 | 4,981 | 0 | 5,103 | 0 | 5,131 | 0 |
| Canada..... | 17,891 | 433 | 14,848 | 2,516 | 16,100 | 5,508 | 18,679 | 5,867 | 17,943 | 6,218 |
| Australia..... | 13,740 | 0 | 10,111 | 36 | 22,040 | 0 | 22,141 | 0 | 0 | 0 |
| Switzerland..... | 17,949 | 47 | 9,854 | 1 | 12,795 | 0 | 13,634 | 214 | 13,896 | 71 |
| Japan..... | 1,707 | 696 | 9,920 | 3,684 | 10,284 | 1,445 | 14,120 | 8,536 | 14,573 | 814 |
| Denmark..... | 8,774 | 100 | 10,322 | 0 | 12,303 | 7 | 11,714 | 1 | 11,874 | 0 |
| Sweden..... | 9,772 | 1 | 9,022 | 157 | 12,830 | 22 | 12,794 | 185 | 8,788 | 214 |
| Irish Free State..... | 0 | 0 | 9,309 | 228 | 7,896 | 473 | 10,005 | 346 | 8,134 | 191 |
| Finland..... | 9,597 | 0 | 6,686 | 0 | 6,557 | 0 | 7,107 | 0 | 7,088 | 0 |
| Total 36 countries..... | 796,961 | 851,996 | 1,196,874 | 1,191,053 | 1,036,099 | 1,146,063 | 1,195,945 | 1,207,994 | 958,671 | 1,146,879 |

Bureau of Agricultural Economics. Official sources. Tobacco comprises leaf, stems, and strippings, but not snuff.

¹ Java and Madura only.

² Average for Austria-Hungary.

³ Year ended June 30.

⁴ Average years ended Dec. 31.

FRUITS AND VEGETABLES

TABLE 176.—*Apples: Production, foreign trade in the United States, and average price per barrel for Baldwin apples at Boston, 1889-1929*

| Year | Production | | Price per bushel received by producers Dec. 1 | Car lot shipments from crop of year shown | | Foreign trade year beginning July 1 ¹ | | | | | | Average price of Baldwin apples at Boston, season November to April ⁴ |
|-------------------|-------------|-------------|---|---|---------------------------------|--|-------------|-------------------------|--|--------------------------|--------------------------|--|
| | Total | Commercial | | Cars | Equivalent bushels ² | Domestic exports | | | Imports, fresh and dried in terms of fresh | Net exports ³ | | |
| | | | | | | Fresh | Dried | Dried in terms of fresh | | Total | Percentage of production | |
| | 1,000 bush. | 1,000 bush. | Dolla. | | 1,000 bush. | 1,000 pounds | 1,000 bush. | 1,000 bush. | 1,000 bush. | P. ct. | Dolla. | |
| 1889 | 143,106 | | | | | 1,361 | 20,861 | 2,173 | | 3,534 | 2.5 | 3.24 |
| 1890 | 80,142 | | | | | 406 | 6,973 | 726 | 49 | 1,083 | 1.4 | 4.40 |
| 1891 | 198,907 | | | | | 2,816 | 26,042 | 2,713 | 21 | 5,508 | 2.8 | 1.78 |
| 1892 | 120,536 | | | | | 1,224 | 7,967 | 830 | 860 | 1,194 | 1.0 | 2.31 |
| 1893 | 114,773 | | | | | 236 | 2,847 | 296 | 278 | 254 | .2 | 4.21 |
| 1894 | 134,648 | | | | | 2,456 | 7,086 | 738 | 378 | 2,816 | 2.1 | 2.40 |
| 1895 | 219,600 | | | | | 1,080 | 26,692 | 2,780 | 153 | 3,707 | 1.7 | 3.10 |
| 1896 | 232,600 | | | | | 4,512 | 30,775 | 3,206 | 198 | 7,520 | 3.2 | 1.03 |
| 1897 | 163,728 | | | | | 1,816 | 31,031 | 3,233 | 23 | 5,026 | 3.1 | 3.23 |
| 1898 | 118,061 | | | | | 1,140 | 19,306 | 2,011 | 236 | 2,915 | 2.5 | 3.18 |
| 1899 | 175,398 | | | | | 1,580 | 34,964 | 3,642 | 79 | 5,143 | 2.9 | 2.94 |
| 1900 | 205,930 | | | | | 2,651 | 28,309 | 2,949 | 57 | 5,543 | 2.7 | 2.28 |
| 1901 | 135,500 | | | | | 1,379 | 15,664 | 1,632 | 42 | 2,969 | 2.2 | 4.07 |
| 1902 | 212,330 | | | | | 4,968 | 39,646 | 4,130 | 16 | 9,082 | 4.3 | 1.93 |
| 1903 | 195,680 | | | | | 6,055 | 48,302 | 5,031 | 39 | 11,047 | 5.7 | 2.40 |
| 1904 | 233,630 | | | | | 4,500 | 39,273 | 4,091 | 20 | 8,571 | 3.7 | 1.96 |
| 1905 | 136,220 | | | | | 3,627 | 27,853 | 2,901 | 99 | 6,429 | 4.7 | 3.59 |
| 1906 | 216,720 | | | | | 4,618 | 45,698 | 4,760 | 16 | 9,362 | 4.3 | 2.44 |
| 1907 | 119,560 | | | | | 3,149 | 24,238 | 2,525 | 262 | 5,412 | 4.5 | 2.35 |
| 1908 | 148,940 | | | | | 2,689 | 33,475 | 3,487 | 45 | 6,131 | 4.1 | 3.99 |
| 1909 | 145,412 | | | | | 2,766 | 25,077 | 2,612 | 95 | 5,283 | 3.6 | 2.99 |
| 1910 | 141,640 | | 0.90 | | | 5,163 | 21,804 | 2,271 | 37 | 7,397 | 5.2 | 3.68 |
| 1911 | 214,020 | | .72 | | | 4,369 | 53,665 | 5,690 | 27 | 9,932 | 4.6 | 2.56 |
| 1912 | 235,220 | | .66 | | | 6,450 | 41,575 | 4,331 | 23 | 10,758 | 4.6 | 2.28 |
| 1913 | 145,410 | | .98 | | | 4,520 | 33,566 | 3,496 | 60 | 7,956 | 5.5 | 3.95 |
| 1914 | 253,200 | | .59 | | | 7,055 | 42,589 | 4,436 | 67 | 11,424 | 4.5 | 2.08 |
| 1915 | 230,011 | | .69 | | | 4,399 | 16,219 | 1,689 | 15 | 6,073 | 2.6 | 2.36 |
| 1916 | 193,905 | 80,241 | .91 | | | 5,220 | 10,358 | 1,079 | 20 | 6,279 | 3.2 | 3.44 |
| 1917 | 166,749 | 67,023 | 1.22 | | | 1,906 | 2,603 | 271 | 46 | 2,131 | 1.3 | 4.40 |
| 1918 | 169,625 | 74,229 | 1.33 | | | 4,720 | 18,909 | 1,970 | 50 | 6,649 | 3.9 | 5.94 |
| 1919 | 136,561 | | | | | | | | | | | |
| 1919 | 142,086 | 78,477 | 1.84 | | | 3,152 | 11,819 | 1,231 | 849 | 3,534 | 2.5 | 6.71 |
| 1920 | 223,677 | 101,715 | 1.15 | 116,117 | 69,670 | 7,995 | 18,053 | 1,881 | 142 | 9,734 | 4.4 | 4.02 |
| 1921 | 99,002 | 64,671 | 1.08 | 89,559 | 53,735 | 3,282 | 12,431 | 1,295 | 1,353 | 3,224 | 3.3 | 6.69 |
| 1922 | 202,702 | 95,835 | .99 | 113,961 | 68,377 | 5,269 | 12,817 | 1,335 | 189 | 6,415 | 3.2 | 4.84 |
| 1923 | 202,842 | 107,806 | 1.02 | 138,184 | 84,405 | 12,295 | 30,410 | 3,168 | 132 | 15,331 | 7.6 | ..... |
| 1924 | 152,967 | | | | | | | | | | | |
| 1924 | 171,725 | 84,039 | 1.18 | 103,843 | 61,763 | 9,604 | 19,225 | 2,002 | 106 | 11,500 | 6.7 | 5.65 |
| 1925 | 172,389 | 99,738 | 1.26 | 127,804 | 77,885 | 11,015 | 24,833 | 2,587 | 74 | 13,528 | 7.8 | 4.88 |
| 1926 | 246,069 | 117,384 | .74 | 135,550 | 80,800 | 21,293 | 32,670 | 3,408 | 84 | 24,612 | 10.0 | 3.42 |
| 1927 | 123,693 | 78,051 | 1.39 | 93,064 | 58,375 | 9,430 | 21,704 | 2,261 | 154 | 11,537 | 9.3 | 6.60 |
| 1928 | 186,893 | 106,383 | .99 | 127,530 | 80,164 | 21,043 | 50,119 | 5,221 | 117 | 26,147 | 14.1 | 4.66 |
| 1929 ⁵ | 139,754 | 86,919 | 1.32 | 100,233 | | | | | | | | |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; Italian figures are census returns. Prices to producers are based upon returns from crop reporters.

¹ For years 1920-1922, it is assumed that the car lots averaged 600 bushels per car. For years 1923 to 1928 inclusive, the estimates of bushels shipped have been calculated according to estimated loadings in each State.

² Compiled from Commerce and Navigation of the United States, 1890-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1926; January and June issues 1927-1929 and official records of the Bureau of Foreign and Domestic Commerce.

³ Total exports (domestic plus foreign) minus imports.

⁴ Figures 1889-1922 from Boston Chamber of Commerce reports, average of weekly quotations of price actually paid by wholesale dealers on days quoted. Figures 1924-1928 from Special Apple Market Report issued by Mass. Dept. of Agr., Div. of Markets, based on prices "for sales by original receivers."

⁵ Preliminary.

⁶ December forecast of total shipments from 1929 crop.

TABLE 177.—Apples: Production, by States, 1924-1929

| State and division | Total | | | | | | Commercial ¹ | | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ² | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ² |
| | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> |
| Maine..... | 3,241 | 3,305 | 2,260 | 2,236 | 1,400 | 3,360 | 1,980 | 1,935 | 1,350 | 1,365 | 861 | 2,076 |
| New Hampshire..... | 1,462 | 1,230 | 1,240 | 1,100 | 1,000 | 974 | 876 | 711 | 762 | 690 | 615 | 594 |
| Vermont..... | 895 | 935 | 800 | 990 | 560 | 1,029 | 480 | 510 | 465 | 570 | 330 | 594 |
| Massachusetts..... | 3,360 | 3,160 | 4,100 | 2,520 | 2,700 | 2,650 | 2,025 | 1,965 | 2,640 | 1,590 | 1,734 | 1,701 |
| Rhode Island..... | 324 | 299 | 391 | 242 | 230 | 253 | 192 | 171 | 237 | 150 | 144 | 150 |
| Connecticut..... | 1,480 | 1,375 | 1,900 | 1,045 | 1,500 | 990 | 855 | 900 | 1,050 | 540 | 753 | 489 |
| New York..... | 22,000 | 32,500 | 40,375 | 13,600 | 21,900 | 16,520 | 11,214 | 18,750 | 18,000 | 8,163 | 12,690 | 10,212 |
| New Jersey..... | 2,800 | 2,660 | 4,310 | 2,697 | 3,280 | 1,880 | 1,836 | 1,821 | 2,832 | 1,833 | 2,238 | 1,200 |
| Pennsylvania..... | 7,800 | 7,300 | 17,000 | 6,300 | 8,460 | 5,973 | 2,340 | 3,033 | 5,388 | 2,550 | 3,129 | 2,286 |
| North Atlantic..... | 43,362 | 52,764 | 72,376 | 30,730 | 41,040 | 33,629 | 21,798 | 29,796 | 32,724 | 17,451 | 22,494 | 19,392 |
| Ohio..... | 6,350 | 6,300 | 11,900 | 5,600 | 5,880 | 2,660 | 2,082 | 2,034 | 3,018 | 1,623 | 1,647 | 741 |
| Indiana..... | 1,800 | 2,430 | 4,100 | 1,249 | 2,520 | 1,170 | 435 | 600 | 864 | 276 | 628 | 243 |
| Illinois..... | 6,400 | 7,300 | 9,000 | 4,450 | 7,150 | 4,725 | 3,300 | 3,645 | 3,870 | 2,250 | 3,720 | 2,520 |
| Michigan..... | 6,000 | 9,000 | 9,045 | 4,288 | 5,400 | 7,020 | 3,000 | 5,100 | 4,467 | 2,271 | 2,787 | 3,618 |
| Wisconsin..... | 1,378 | 2,106 | 2,158 | 1,200 | 2,160 | 1,749 | 294 | 471 | 465 | 270 | 477 | 396 |
| Minnesota..... | 850 | 820 | 1,263 | 854 | 1,230 | 726 | 114 | 114 | 171 | 111 | 114 | 87 |
| Iowa..... | 2,800 | 2,400 | 3,652 | 1,720 | 2,740 | 2,120 | 450 | 240 | 402 | 207 | 330 | 255 |
| Missouri..... | 4,300 | 4,100 | 5,015 | 2,104 | 3,380 | 2,800 | 1,764 | 1,938 | 1,857 | 870 | 1,422 | 1,140 |
| South Dakota..... | 150 | 62 | 169 | 200 | 230 | 140 | — | — | — | — | — | — |
| Nebraska..... | 1,000 | 450 | 700 | 850 | 470 | 868 | 360 | 195 | 228 | 330 | 90 | 270 |
| Kansas..... | 2,200 | 1,600 | 1,428 | 1,925 | 820 | 1,310 | 1,032 | 855 | 930 | 1,347 | 540 | 864 |
| North Central..... | 33,228 | 36,568 | 48,430 | 24,410 | 31,980 | 25,288 | 12,831 | 15,192 | 16,272 | 9,555 | 11,655 | 10,134 |
| Delaware..... | 1,250 | 1,340 | 2,376 | 1,150 | 1,520 | 1,012 | 630 | 1,140 | 1,980 | 900 | 1,290 | 861 |
| Maryland..... | 1,850 | 1,900 | 3,500 | 1,700 | 2,190 | 2,200 | 942 | 972 | 1,800 | 1,200 | 1,326 | 1,365 |
| Virginia..... | 14,500 | 7,844 | 19,902 | 6,600 | 10,100 | 13,000 | 7,560 | 4,320 | 11,100 | 4,950 | 11,100 | 9,300 |
| West Virginia..... | 7,000 | 4,185 | 10,875 | 5,000 | 8,750 | 5,600 | 2,400 | 2,247 | 5,100 | 4,050 | 4,410 | 4,200 |
| North Carolina..... | 6,500 | 3,192 | 5,986 | 1,825 | 5,040 | 2,628 | 921 | 480 | 1,035 | 273 | 750 | 450 |
| South Carolina..... | 600 | 386 | 647 | 363 | 480 | 308 | — | — | — | — | — | — |
| Georgia..... | 1,500 | 741 | 1,827 | 595 | 1,400 | 680 | 360 | 180 | 456 | 240 | 351 | 228 |
| South Atlantic..... | 33,050 | 19,588 | 45,113 | 17,233 | 35,480 | 25,428 | 13,113 | 9,339 | 21,471 | 11,613 | 10,227 | 16,404 |
| Kentucky..... | 5,700 | 2,625 | 6,408 | 720 | 5,700 | 2,000 | 486 | 210 | 501 | 75 | 456 | 159 |
| Tennessee..... | 4,800 | 1,984 | 5,360 | 1,152 | 3,790 | 2,060 | 318 | 123 | 375 | 81 | 264 | 138 |
| Alabama..... | 1,190 | 595 | 1,328 | 328 | 885 | 500 | — | — | — | — | — | — |
| Mississippi..... | 270 | 221 | 324 | 152 | 250 | 185 | — | — | — | — | — | — |
| Arkansas..... | 4,100 | 4,315 | 3,450 | 1,015 | 2,200 | 1,400 | 2,160 | 1,950 | 1,500 | 609 | 1,242 | 660 |
| Louisiana..... | 30 | 28 | 35 | 18 | 30 | 25 | — | — | — | — | — | — |
| Oklahoma..... | 1,170 | 644 | 770 | 493 | 350 | 634 | 162 | 87 | 93 | 60 | 33 | 72 |
| Texas..... | 330 | 264 | 380 | 168 | 216 | 230 | — | — | — | — | — | — |
| South Central..... | 17,590 | 10,676 | 18,055 | 4,046 | 13,421 | 6,974 | 3,126 | 2,370 | 2,469 | 825 | 1,995 | 1,029 |
| Montana..... | 290 | 80 | 410 | 295 | 516 | 420 | 210 | 42 | 309 | 153 | 450 | 375 |
| Idaho..... | 2,178 | 6,029 | 4,200 | 6,000 | 5,500 | 5,500 | 1,800 | 5,250 | 2,775 | 5,478 | 4,800 | 4,950 |
| Wyoming..... | 50 | 25 | 47 | 40 | 48 | 35 | — | — | — | — | — | — |
| Colorado..... | 3,024 | 3,200 | 3,444 | 2,592 | 3,020 | 2,460 | 2,418 | 2,860 | 2,907 | 2,253 | 2,700 | 2,100 |
| New Mexico..... | 840 | 1,021 | 1,147 | 456 | 675 | 1,035 | 507 | 780 | 600 | 360 | 507 | 756 |
| Arizona..... | 70 | 98 | 112 | 62 | 76 | 104 | 21 | 30 | 33 | 30 | 24 | 30 |
| Utah..... | 600 | 1,300 | 817 | 660 | 880 | 500 | 360 | 900 | 480 | 450 | 570 | 240 |
| Nevada..... | 40 | 74 | 42 | 18 | 52 | 25 | — | — | — | — | — | — |
| Washington..... | 22,000 | 29,550 | 34,030 | 25,343 | 33,500 | 26,656 | 18,825 | 26,010 | 25,950 | 22,302 | 30,000 | 24,900 |
| Oregon..... | 6,500 | 5,400 | 8,036 | 4,320 | 7,000 | 4,000 | 5,500 | 3,888 | 5,250 | 2,925 | 5,100 | 2,250 |
| California..... | 8,903 | 6,016 | 10,350 | 7,458 | 13,105 | 7,700 | 4,470 | 3,291 | 6,144 | 4,656 | 6,861 | 4,299 |
| Far Western..... | 44,495 | 52,793 | 62,635 | 47,244 | 64,972 | 48,435 | 33,171 | 43,041 | 44,448 | 38,607 | 51,012 | 39,960 |
| United States..... | 171,725 | 172,389 | 246,609 | 123,693 | 186,893 | 139,754 | 84,039 | 96,738 | 117,384 | 78,051 | 106,383 | 86,919 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Included in "Total crop." By commercial crop is meant that portion of the total crop which is sold for consumption as fresh fruit.² Preliminary.

TABLE 178.—Apples: Car-lot shipments by State of origin, 1928-2

| State and year | Crop movement season ¹ | | | | | | | | | | | | | | Total |
|-------------------|-----------------------------------|------|-------|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|------|---------|
| | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | | |
| EASTERN | | | | | | | | | | | | | | | |
| New England: | Cars | Cars | Cars | Cars | Cars | Cars | Cars | Cars | Cars | Cars | Cars | Cars | Cars | Cars | Cars |
| 1928 ² | --- | --- | 4 | 115 | 741 | 376 | 43 | 27 | 18 | 16 | 1 | --- | --- | --- | 1,341 |
| 1929 ² | --- | --- | 2 | 188 | 922 | 467 | 46 | --- | --- | --- | --- | --- | --- | --- | --- |
| New York: | --- | 14 | 319 | 1,237 | 2,999 | 2,004 | 1,390 | 1,636 | 1,508 | 1,220 | 782 | 450 | 112 | --- | 13,671 |
| 1928 ² | --- | 39 | 230 | 823 | 1,795 | 1,053 | 725 | --- | --- | --- | --- | --- | --- | --- | --- |
| Pennsylvania: | --- | 8 | 40 | 140 | 1,184 | 352 | 275 | 389 | 287 | 92 | 22 | 7 | --- | --- | 2,706 |
| 1928 ² | --- | 21 | 62 | 260 | 862 | 256 | 168 | --- | --- | --- | --- | --- | --- | --- | --- |
| Illinois: | --- | 118 | 603 | 297 | 1,775 | 1,857 | 128 | 30 | 32 | 45 | 33 | 27 | 11 | --- | 5,016 |
| 1929 ² | --- | 253 | 306 | 229 | 903 | 411 | 13 | 7 | --- | --- | --- | --- | --- | --- | --- |
| Michigan: | --- | --- | 247 | 416 | 1,278 | 504 | 42 | 26 | 41 | 45 | 28 | 18 | 6 | --- | 2,651 |
| 1928 ² | --- | --- | 7 | 203 | 433 | 2,037 | 847 | 87 | --- | --- | --- | --- | --- | --- | --- |
| Missouri: | --- | 24 | 53 | 657 | 646 | 59 | 43 | 39 | 63 | 55 | 83 | 35 | 1 | --- | 1,758 |
| 1929 ² | --- | 10 | 23 | 36 | 283 | 254 | 11 | 17 | --- | --- | --- | --- | --- | --- | --- |
| Delaware: | --- | 2 | 490 | 270 | 203 | 330 | 13 | 7 | 15 | 16 | 6 | --- | --- | --- | 1,352 |
| 1928 ² | --- | 110 | 488 | 31 | 72 | 94 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Maryland: | --- | --- | 173 | 134 | 321 | 785 | 220 | 55 | 27 | 6 | 1 | --- | --- | --- | 1,722 |
| 1928 ² | --- | 19 | 124 | 83 | 350 | 887 | 294 | 48 | --- | --- | --- | --- | --- | --- | --- |
| Virginia: | --- | --- | 152 | 800 | 4,083 | 8,225 | 3,049 | 1,166 | 1,119 | 650 | 500 | 204 | 166 | 159 | 20,282 |
| 1928 ² | --- | --- | 182 | 813 | 4,073 | 5,360 | 1,162 | 933 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| West Virginia: | --- | 69 | 240 | 1,295 | 3,182 | 1,058 | 346 | 227 | 102 | 57 | 17 | 15 | --- | --- | 6,008 |
| 1928 ² | --- | 2 | 191 | 386 | 1,480 | 3,397 | 951 | 181 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Arkansas: | --- | 9 | 15 | 208 | 437 | 448 | 34 | 15 | 27 | 21 | 27 | 16 | 8 | --- | 1,265 |
| 1928 ² | --- | 8 | 11 | 210 | 85 | 75 | 5 | 1 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Other Eastern: | --- | 67 | 229 | 269 | 966 | 1,680 | 413 | 100 | 101 | 133 | 118 | 78 | 56 | 6 | 4,216 |
| 1928 ² | --- | 110 | 206 | 327 | 911 | 935 | 112 | 41 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total, Eastern: | --- | 196 | 1,867 | 2,881 | 11,645 | 23,355 | 8,210 | 3,512 | 3,665 | 2,899 | 2,170 | 1,258 | 766 | 284 | 62,708 |
| 1928 ² | --- | 512 | 1,691 | 2,612 | 9,861 | 17,029 | 5,171 | 2,254 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| WESTERN | | | | | | | | | | | | | | | |
| Idaho: | --- | --- | 3 | --- | 1,142 | 3,025 | 1,085 | 430 | 369 | 239 | 149 | 57 | 9 | --- | 6,508 |
| 1928 ² | --- | --- | --- | --- | 393 | 4,273 | 1,119 | 461 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Colorado: | --- | --- | --- | 1 | 266 | 1,375 | 710 | 217 | 64 | 82 | 79 | 16 | --- | --- | 2,804 |
| 1928 ² | --- | --- | --- | --- | 112 | 1,352 | 577 | 148 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Washington: | --- | 128 | 230 | 4,431 | 13,302 | 7,775 | 3,373 | 3,015 | 4,036 | 2,567 | 1,385 | 845 | 230 | --- | 41,317 |
| 1928 ² | --- | 18 | 102 | 1,981 | 11,313 | 6,210 | 2,521 | --- | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Oregon: | --- | 4 | 63 | 485 | 2,846 | 1,369 | 572 | 433 | 261 | 272 | 118 | 21 | 3 | --- | 6,447 |
| 1928 ² | --- | --- | 2 | 97 | 927 | 553 | 176 | --- | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| California: | --- | 34 | 1,450 | 1,134 | 1,212 | 1,159 | 372 | 174 | 201 | 211 | 163 | 105 | 68 | 17 | 6,300 |
| 1928 ² | --- | 2 | 306 | 804 | 583 | 696 | 253 | 152 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Other Western: | --- | --- | --- | 21 | 230 | 839 | 253 | 31 | 27 | 21 | 18 | 5 | 1 | --- | 1,446 |
| 1928 ² | --- | --- | --- | 131 | 369 | 830 | 163 | 17 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total, Western: | --- | 34 | 1,585 | 1,449 | 7,760 | 22,546 | 11,564 | 4,797 | 4,109 | 4,850 | 3,248 | 1,686 | 944 | 250 | 64,822 |
| 1928 ² | --- | 2 | 324 | 1,129 | 3,535 | 19,391 | 8,876 | 3,476 | --- | --- | --- | --- | --- | --- | --- |
| 1929 ² | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total: | --- | 152 | 3,360 | 4,122 | 16,689 | 49,876 | 26,571 | 8,061 | 8,269 | 8,213 | 6,370 | 3,469 | 2,295 | 707 | 138,184 |
| 1924 | --- | 205 | 2,362 | 3,126 | 14,641 | 39,866 | 20,231 | 6,399 | 5,294 | 4,023 | 3,277 | 2,295 | 1,615 | 509 | 103,843 |
| 1925 | --- | 433 | 2,895 | 4,330 | 20,905 | 44,895 | 20,085 | 7,372 | 6,253 | 6,855 | 6,228 | 4,114 | 2,494 | 945 | 127,804 |
| 1926 | --- | 260 | 3,840 | 3,387 | 20,950 | 45,321 | 23,251 | 8,365 | 7,969 | 8,020 | 5,348 | 3,596 | 2,355 | 888 | 133,550 |
| 1927 | --- | 253 | 1,815 | 3,539 | 12,106 | 33,556 | 17,109 | 5,963 | 5,315 | 4,900 | 3,500 | 2,355 | 1,819 | 864 | 93,094 |
| 1928 ¹ | --- | 230 | 3,452 | 4,330 | 19,405 | 45,901 | 19,774 | 8,309 | 7,774 | 7,749 | 5,418 | 2,944 | 1,710 | 534 | 127,530 |
| 1929 ² | --- | 514 | 2,015 | 3,741 | 13,396 | 36,420 | 14,046 | 5,729 | --- | --- | --- | --- | --- | --- | --- |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. See preceding Yearbooks for data for earlier years.

¹ Crop movement season extends from June 1 of 1 year through June of the following year.

² Preliminary.

STATISTICS OF FRUITS AND VEGETABLES

723

TABLE 179.—Apples: Cold-storage holdings, United States, 1915–1929

BARRELS¹

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels |
| 1915 | 2,929 | 2,438 | 1,710 | 896 | 299 | 61 | ----- | 3,093 | 4,213 |
| 1916 | 3,743 | 3,321 | 2,543 | 1,561 | 799 | 218 | ----- | 2,530 | 3,166 |
| 1917 | 2,680 | 2,121 | 1,560 | 1,044 | 543 | 183 | ----- | 2,558 | 3,195 |
| 1918 | 2,754 | 2,226 | 1,575 | 978 | 356 | 101 | ----- | 2,915 | 3,280 |
| 1919 | 2,582 | 1,704 | 962 | 487 | 198 | 68 | 824 | 3,108 | 3,326 |
| 1920 | 2,693 | 2,092 | 1,385 | 705 | 274 | 64 | 452 | 3,516 | 4,570 |
| 1921 | 3,966 | 3,016 | 2,020 | 1,027 | 449 | 170 | 570 | 1,822 | 1,970 |
| 1922 | 1,742 | 1,424 | 996 | 561 | 248 | 74 | 1,219 | 4,133 | 4,319 |
| 1923 | 3,708 | 2,839 | 2,013 | 1,199 | 578 | 150 | 664 | 4,619 | 5,477 |
| 1924 | 4,962 | 3,993 | 3,024 | 1,925 | 1,113 | 451 | 513 | 3,551 | 4,167 |
| 1925 | 3,643 | 2,811 | 2,066 | 1,151 | 513 | 175 | 1,058 | 4,434 | 5,051 |
| 1926 | 4,556 | 3,714 | 2,667 | 1,531 | 727 | 262 | 601 | 3,933 | 5,458 |
| 1927 | 4,901 | 3,857 | 2,682 | 1,603 | 828 | 295 | 610 | 2,967 | 3,357 |
| 1928 | 2,758 | 2,038 | 1,358 | 801 | 415 | 195 | 1,013 | 4,622 | 4,775 |
| 1929 | 3,767 | 2,746 | 1,852 | 1,088 | 516 | 181 | 1,333 | 4,315 | 4,301 |

BOXES

| | | | | | | | | | |
|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes |
| 1915 | 4,091 | 3,441 | 2,323 | 1,341 | 525 | 142 | ----- | 1,789 | 3,085 |
| 1916 | 3,210 | 2,738 | 2,096 | 1,268 | 709 | 258 | ----- | 2,190 | 3,977 |
| 1917 | 4,356 | 3,790 | 2,646 | 1,504 | 796 | 246 | ----- | 2,216 | 4,483 |
| 1918 | 5,534 | 5,192 | 3,764 | 2,416 | 966 | 172 | ----- | 2,513 | 4,945 |
| 1919 | 5,137 | 4,205 | 2,431 | 1,410 | 545 | 170 | 440 | 4,244 | 7,793 |
| 1920 | 8,508 | 7,296 | 5,331 | 2,982 | 1,588 | 447 | 277 | 2,878 | 6,651 |
| 1921 | 7,259 | 6,266 | 4,890 | 3,548 | 2,009 | 826 | 667 | 5,464 | 11,281 |
| 1922 | 11,061 | 8,667 | 6,282 | 4,107 | 2,088 | 721 | 669 | 4,164 | 7,271 |
| 1923 | 8,319 | 7,612 | 5,593 | 3,345 | 1,475 | 380 | 789 | 6,886 | 9,866 |
| 1924 | 14,201 | 11,550 | 8,821 | 5,837 | 2,901 | 949 | 820 | 6,620 | 13,917 |
| 1925 | 9,089 | 7,264 | 5,266 | 3,412 | 1,801 | 674 | 1,091 | 9,165 | 13,041 |
| 1926 | 11,868 | 10,009 | 7,898 | 5,350 | 2,892 | 1,104 | 1,809 | 9,523 | 15,083 |
| 1927 | 13,365 | 10,435 | 7,298 | 4,613 | 2,312 | 717 | 1,043 | 9,074 | 13,423 |
| 1928 | 12,260 | 9,809 | 7,023 | 4,960 | 2,889 | 1,223 | 1,854 | 12,333 | 17,462 |
| 1929 | 15,853 | 12,388 | 7,995 | 4,889 | 2,224 | 631 | 901 | 11,045 | 16,235 |

TOTAL, IN BUSHELS

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1915 | 12,879 | 10,755 | 7,473 | 4,029 | 1,422 | 324 | ----- | 11,067 | 16,323 |
| 1916 | 14,439 | 12,708 | 9,726 | 5,952 | 3,105 | 912 | ----- | 9,780 | 13,476 |
| 1917 | 12,396 | 10,155 | 7,326 | 4,635 | 2,424 | 795 | ----- | 9,888 | 14,067 |
| 1918 | 13,797 | 11,871 | 8,490 | 5,349 | 2,034 | 477 | ----- | 11,256 | 14,784 |
| 1919 | 12,882 | 9,315 | 5,316 | 2,868 | 1,140 | 375 | 2,913 | 13,569 | 17,769 |
| 1920 | 16,587 | 13,572 | 9,486 | 5,097 | 2,418 | 639 | 1,632 | 13,425 | 20,361 |
| 1921 | 19,158 | 15,315 | 10,950 | 6,630 | 3,357 | 1,335 | 2,376 | 10,929 | 17,217 |
| 1922 | 16,287 | 12,939 | 9,270 | 5,790 | 2,832 | 942 | 4,356 | 16,563 | 20,229 |
| 1923 | 18,443 | 16,128 | 11,631 | 6,942 | 3,210 | 831 | 2,781 | 20,742 | 30,297 |
| 1924 | 20,088 | 23,529 | 17,595 | 11,613 | 6,240 | 2,304 | 2,460 | 17,274 | 22,419 |
| 1925 | 20,019 | 15,699 | 11,283 | 6,864 | 3,429 | 1,197 | 4,266 | 22,467 | 28,194 |
| 1926 | 25,536 | 21,153 | 15,900 | 9,942 | 5,073 | 1,890 | 3,612 | 21,321 | 31,458 |
| 1927 | 28,068 | 22,005 | 15,342 | 9,423 | 4,704 | 1,602 | 3,114 | 17,076 | 23,493 |
| 1928 | 20,534 | 15,923 | 11,097 | 7,363 | 4,134 | 1,808 | 4,893 | 26,199 | 31,177 |
| 1929 | 27,154 | 20,626 | 13,551 | 8,153 | 3,772 | 1,174 | 4,900 | 23,991 | 28,139 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

¹ All apples, except those packed in western-style boxes, are tabulated in terms of barrels, on the basis of 3 bushels to the barrel; since Oct. 1, 1923, apples packed in bushel baskets are also included in this tabulation. Three boxes are considered the equivalent of 1 barrel.

TABLE 180.—Apples: ¹ *International trade, average 1911-1913, annual 1925-1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|-------------------------------|--------------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------|----------------|
| | Average, 1911-1913 | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| United States | 840 | 9,870 | 84 | 10,044 | 51 | 16,170 | 163 | 15,534 | 112 | 13,635 |
| Canada | 340 | 3,858 | 459 | 4,011 | 546 | 3,579 | 631 | 2,902 | 633 | 2,877 |
| France ² | 267 | 7,140 | 261 | 4,266 | 292 | 2,023 | 545 | 1,707 | 1,015 | 1,012 |
| Australia ³ | 78 | 1,140 | 0 | 1,824 | 0 | 2,702 | 0 | 1,310 | — | — |
| Netherlands | 105 | 933 | 152 | 2,178 | 610 | 583 | 401 | 1,462 | 391 | 586 |
| Belgium | 792 | 936 | 300 | 1,323 | 176 | 1,107 | 361 | 1,301 | 274 | 722 |
| Italy | 39 | 660 | 0 | 1,138 | 0 | 1,876 | 0 | 1,659 | 1 | 1,405 |
| Rumania | 6 | 0 | 0 | 1,083 | 0 | 769 | — | — | — | — |
| New Zealand | ² 51 | ² 15 | 38 | 177 | 31 | 604 | 36 | 441 | 21 | 814 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom | 7,686 | 0 | 13,154 | 0 | 18,339 | 0 | 13,511 | 0 | 13,407 | 0 |
| Germany | 14,154 | 93 | 8,581 | 69 | 8,322 | 15 | 7,891 | 31 | 9,777 | 17 |
| Sweden | 132 | 3 | 537 | 0 | 603 | 1 | 757 | 0 | 874 | 0 |
| Egypt | — | — | 336 | 0 | 357 | 1 | 366 | 2 | 347 | ² 2 |
| Denmark | 108 | 3 | 393 | 0 | 621 | 0 | 943 | 0 | 678 | 0 |
| Irish Free State | — | — | 489 | 0 | 525 | 0 | 449 | 0 | 441 | 0 |
| Norway ² | 222 | 0 | 168 | 0 | 189 | 0 | 249 | 0 | 185 | 0 |
| Finland | 192 | 0 | 141 | 0 | 161 | 0 | 161 | 0 | 210 | 0 |
| Brazil | 81 | 0 | 142 | 0 | 203 | 0 | 128 | 0 | — | — |
| Cuba | 39 | 0 | 91 | 0 | 90 | 0 | 130 | 0 | — | — |
| Poland | — | — | 84 | 42 | 4 | 8 | 30 | 8 | 49 | 25 |
| Total, 20 countries | 25,092 | 24,651 | 25,410 | 26,155 | 31,123 | 29,438 | 26,752 | 26,453 | 28,415 | 21,195 |

Bureau of Agricultural Economics. Official sources.

¹ Foreign weights are converted to bushels on the basis of 48 pounds per bushel; domestic, one barrel equals 3 boxes (or bushels).² Includes pears.³ Year ended June 30.TABLE 181.—Apples: *Estimated average price per bushel, received by producers, United States, 1910-1929*

| Year beginning June— | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | Weighted average ¹ |
|----------------------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|--------|-------------------------------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1910 | 112.0 | 76.9 | 73.8 | 73.6 | 77.4 | 80.3 | 100.2 | 115.7 | 118.6 | 124.7 | 138.8 | 139.6 | 88.1 |
| 1911 | 135.4 | 94.8 | 73.0 | 70.2 | 65.8 | 73.1 | 86.1 | 92.7 | 98.8 | 103.5 | 114.9 | 128.8 | 76.6 |
| 1912 | 108.0 | 82.5 | 67.5 | 62.2 | 61.3 | 63.5 | 72.6 | 74.3 | 76.4 | 82.4 | 85.0 | 94.0 | 66.8 |
| 1913 | 101.2 | 86.0 | 75.2 | 76.5 | 85.6 | 94.4 | 103.6 | 110.0 | 123.0 | 128.9 | 137.1 | 146.4 | 93.0 |
| 1914 | 135.6 | 91.2 | 68.6 | 61.6 | 56.0 | 57.3 | 66.6 | 69.3 | 73.1 | 73.4 | 80.1 | 90.6 | 62.7 |
| 1915 | 90.3 | 78.4 | 61.8 | 58.0 | 66.1 | 72.4 | 77.0 | 86.1 | 90.5 | 91.2 | 94.8 | 97.5 | 71.0 |
| 1916 | 104.9 | 86.5 | 80.7 | 75.6 | 82.5 | 92.0 | 103.4 | 104.3 | 114.4 | 126.9 | 137.1 | 142.9 | 90.7 |
| 1917 | 146.5 | 125.1 | 100.6 | 96.6 | 105.1 | 116.8 | 127.4 | 132.9 | 138.5 | 142.6 | 143.9 | 155.8 | 113.6 |
| 1918 | 144.6 | 125.7 | 114.5 | 118.9 | 129.4 | 138.9 | 150.9 | 148.9 | 159.8 | 190.1 | 203.5 | 220.8 | 137.5 |
| 1919 | 223.4 | 187.6 | 161.4 | 153.2 | 175.6 | 184.9 | 213.9 | 215.9 | 229.2 | 236.7 | 253.5 | 285.8 | 186.1 |
| 1920 | 249.1 | 196.7 | 152.1 | 134.6 | 125.9 | 130.7 | 143.2 | 130.8 | 132.8 | 134.7 | 142.2 | 162.3 | 133.8 |
| 1921 | 173.9 | 165.9 | 165.1 | 171.4 | 196.4 | 215.7 | 224.5 | 183.5 | 206.7 | 206.2 | 194.5 | 241.4 | 195.2 |
| 1922 | 202.7 | 181.7 | 100.4 | 94.3 | 93.4 | 101.5 | 108.6 | 131.5 | 142.3 | 144.9 | 156.5 | 178.7 | 109.4 |
| 1923 | 188.6 | 166.7 | 121.4 | 108.0 | 114.0 | 114.6 | 114.0 | 121.3 | 125.0 | 129.1 | 129.4 | 131.3 | 117.4 |
| 1924 | 159.3 | 141.3 | 121.6 | 109.8 | 115.9 | 119.5 | 128.2 | 144.9 | 150.7 | 155.4 | 158.4 | 179.2 | 122.1 |
| 1925 | 201.4 | 158.7 | 130.7 | 112.5 | 120.5 | 127.7 | 137.4 | 146.3 | 146.3 | 139.8 | 143.2 | 148.2 | 127.0 |
| 1926 | 198.7 | 133.9 | 103.8 | 88.4 | 80.2 | 81.6 | 87.7 | 97.3 | 98.8 | 100.0 | 103.8 | 113.5 | 88.3 |
| 1927 | 140.0 | 144.4 | 135.8 | 130.7 | 134.7 | 141.8 | 152.4 | 161.7 | 168.3 | 177.0 | 183.3 | 190.6 | 141.7 |
| 1928 | 188.7 | 156.0 | 105.5 | 96.6 | 98.4 | 107.9 | 118.5 | 124.1 | 129.9 | 134.0 | 133.5 | 147.9 | 110.3 |
| 1929 | 153.1 | 100.5 | 138.9 | 131.0 | 137.9 | 135.6 | 143.4 | — | — | — | — | — | — |

¹ Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices weighted by production of apples for each State; yearly price obtained by weighting, monthly prices by car-load shipments.

TABLE 182.—Apples: Average l. c. l. price to jobbers, 1927-1929¹BARRELS²

| Market, variety, and year | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May |
|---------------------------|----------------|-------------------|----------------|-------------------|-------------------|-------------------|----------------|----------------|----------------|
| NEW YORK | | | | | | | | | |
| Baldwin: | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| 1927..... | | | 5.93 | 6.31 | 6.44 | 7.28 | 8.02 | 8.25 | 8.69 |
| 1928..... | | | 5.16 | ³ 5.19 | ³ 5.30 | ³ 5.12 | 5.16 | 5.00 | 5.83 |
| 1929..... | | | 5.74 | 5.72 | | | | | |
| Rhode Island Greening: | | | | | | | | | |
| 1927..... | | 6.48 | 7.80 | 8.00 | 8.50 | 9.75 | | | |
| 1928..... | | 5.12 | 5.42 | 5.22 | 5.16 | 5.40 | 5.20 | | |
| 1929..... | | 6.10 | 7.05 | 6.84 | | | | | |
| McIntosh: | | | | | | | | | |
| 1927..... | 7.31 | 7.72 | 8.86 | 9.24 | 9.94 | 10.31 | | | |
| 1928..... | | 7.77 | 10.08 | 10.03 | 9.80 | 9.58 | 9.10 | | |
| 1929..... | 8.47 | 7.76 | 8.57 | 8.71 | | | | | |
| York Imperial: | | | | | | | | | |
| 1927..... | | ³ 5.32 | 5.73 | 6.13 | 6.79 | 7.36 | 8.03 | | |
| 1928..... | | | 4.25 | 4.64 | 4.40 | | | | |
| 1929..... | | 4.69 | 4.93 | | | | | | |
| CHICAGO | | | | | | | | | |
| Baldwin: | | | | | | | | | |
| 1927..... | | | 6.68 | 6.85 | 7.52 | 7.86 | 8.78 | 8.23 | 8.64 |
| 1928..... | | | 4.75 | | 6.04 | 6.16 | 6.08 | 5.91 | |
| 1929..... | | | | | | | | | |
| Rhode Island Greening: | | | | | | | | | |
| 1927..... | | 7.37 | 8.76 | 9.64 | 9.96 | | | | |
| 1928..... | | 5.96 | 6.14 | 6.49 | 6.05 | 6.21 | 5.99 | | |
| 1929..... | | | | | | | | | |
| Jonathan: | | | | | | | | | |
| 1927..... | 7.83 | 7.63 | 8.53 | 8.78 | 8.65 | 9.86 | | | |
| 1928..... | 5.70 | 5.81 | 6.08 | 6.57 | 6.13 | 6.60 | | 7.50 | |
| 1929..... | 7.37 | 7.18 | | | | | | | |
| King (Tompkins): | | | | | | | | | |
| 1927..... | | | 5.12 | 5.51 | ³ 5.25 | | | | |
| 1929..... | | | | | | | | | |
| Northern Spy: | | | | | | | | | |
| 1927..... | | | 9.35 | 9.98 | 9.83 | 10.00 | 9.78 | 9.66 | 9.54 |
| 1928..... | | | | 8.00 | 7.91 | | 8.53 | 8.33 | |
| 1929..... | | | | | | | | | |

BOXES⁴

| | | | | | | | | | |
|----------------|------|-------------------|-------------------|-------------------|------|-------------------|-------------------|------|------|
| CHICAGO | | | | | | | | | |
| Delicious: | | | | | | | | | |
| 1927..... | | ³ 3.86 | ³ 3.88 | 4.35 | 4.43 | 4.60 | 4.80 | | |
| 1928..... | | 3.02 | ³ 3.05 | 3.20 | 3.12 | 3.31 | 3.37 | 3.73 | 4.27 |
| 1929..... | | 3.72 | ³ 3.78 | 3.76 | | | | | |
| Jonathan: | | | | | | | | | |
| 1927..... | | ³ 2.79 | ³ 3.11 | | | | | | |
| 1928..... | 2.51 | 2.07 | ³ 2.16 | ³ 2.42 | 2.53 | 2.83 | | | |
| 1929..... | 3.28 | 2.96 | 2.95 | 3.07 | | | | | |
| Rome Beauty: | | | | | | | | | |
| 1927..... | | ³ 3.62 | ³ 3.19 | 3.23 | 3.11 | ³ 3.37 | ³ 3.14 | | |
| 1928..... | | 2.35 | ³ 2.25 | 2.15 | 2.32 | 2.60 | 2.56 | | |
| 1929..... | | | ³ 3.03 | ³ 3.00 | | | | | |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives at these markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices. See 1927 year book, p. 837, for data for 1921-1926.

¹ Commodity reports began Aug. 29, 1927 and 1928; Sept. 3, 1929. Last commodity report of season May 28, 1927; May 26, 1928; May 25, 1929.

² Quotations on 2½ inch stock unless otherwise stated.

³ Less than ten quotations.

⁴ Quotations on medium-large stock unless otherwise stated.

⁵ Quotations include very large stock.

TABLE 183.—*Citrus fruits: Car-lot shipments, by States of origin, 1920-1928*ORANGES¹

| State | Crop-movement season ² | | | | | | | | |
|------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 ³ |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| California..... | 46,844 | 28,376 | 48,346 | 44,905 | 34,439 | 47,017 | 53,511 | 43,693 | 68,559 |
| Florida..... | 20,859 | 45,718 | 23,006 | 33,418 | 25,091 | 19,625 | 22,536 | 16,453 | 32,550 |
| Alabama..... | 87 | 145 | 476 | 600 | 2 | 338 | 179 | 312 | 97 |
| Mississippi..... | | | 9 | 13 | | 8 | 4 | 15 | 5 |
| Louisiana..... | | | | 3 | 2 | 1 | 1 | 251 | 264 |
| Texas..... | | | | 3 | 3 | 6 | 9 | 26 | 33 |
| Arizona..... | 49 | 78 | 71 | 94 | 45 | 96 | 73 | 33 | 66 |
| Total..... | 67,839 | 44,317 | 71,908 | 79,036 | 59,582 | 67,091 | 76,313 | 60,783 | 101,574 |

GRAPEFRUIT

| | | | | | | | | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Florida..... | 11,115 | 12,943 | 16,969 | 19,614 | 20,087 | 14,269 | 17,301 | 14,166 | 21,844 |
| Texas..... | | 8 | 48 | 99 | 521 | 298 | 747 | 1,036 | 1,617 |
| California..... | 451 | 503 | 507 | 469 | 449 | 546 | 597 | 756 | 819 |
| Arizona..... | 48 | 62 | 103 | 155 | 159 | 218 | 210 | 211 | 272 |
| Total..... | 11,614 | 13,516 | 17,627 | 20,337 | 21,216 | 15,331 | 18,858 | 16,169 | 24,552 |

LEMONS

| | | | | | | | | | |
|-----------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|
| California..... | 11,836 | 9,907 | 8,946 | 13,388 | 11,680 | 13,981 | 13,196 | 12,745 | 17,424 |
| Texas..... | | | | 1 | 2 | | | | |
| Arizona..... | | | 1 | 2 | 1 | 1 | | | |
| Total..... | 11,836 | 9,907 | 8,947 | 13,391 | 11,683 | 13,982 | 13,196 | 12,745 | 17,424 |

MIXED CITRUS⁴

| | | | | | | | | | |
|-----------------|--|--|-------|-------|-------|-------|-------|-------|--------|
| Florida..... | | | 2,631 | 3,608 | 4,226 | 3,565 | 5,313 | 6,225 | 9,109 |
| California..... | | | 1,033 | 1,461 | 1,148 | 1,605 | 1,639 | 1,590 | 1,753 |
| Texas..... | | | 18 | 1 | 18 | | 22 | 92 | 185 |
| Arizona..... | | | 3 | | 10 | 1 | 10 | 11 | 24 |
| Louisiana..... | | | | | | | | 1 | 1 |
| Total..... | | | 3,685 | 5,070 | 5,402 | 5,171 | 6,984 | 7,919 | 11,072 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹Include tangerines.

²Crop movement season extends as follows: Oranges, from Sept. 1 of one year through August of the following year, except in California, where the season extends from Nov. 1 through October of the following year; grapefruit, from Sept. 1 of one year through August of the following year; lemons, from Nov. 1 of one year through October of the following year; mixed citrus, from Sept. 1 of one year through August of the following year, except in California, where the season extends from Nov. 1 through October of the following year.

³Preliminary.

⁴Includes one car in August, 1921.

⁵Reported in October, 1924.

⁶No reports available before 1922.

TABLE 184.—*Citrus fruit production, by States, 1899, 1909, 1919-1929*¹

| Year | California | | | Florida ² | | Texas | | Arizona | | Alabama, ³ oranges | | Louisiana, oranges | Mississippi, oranges |
|-------------------|-------------|-------------|-------------|----------------------|-------------|-------------|-------------|-------------|-------------|-------------------------------|-------------|--------------------|----------------------|
| | Oranges | Grapefruit | Lemons | Oranges | Grapefruit | Oranges | Grapefruit | Oranges | Grapefruit | Oranges | Oranges | Oranges | Oranges |
| | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes |
| 1899 ⁴ | 5,882 | 18 | 874 | 273 | 12 | 11 | (5) | 33 | 1 | 1 | 152 | 5 | 5 |
| 1909 ¹ | 14,140 | 123 | 2,756 | 4,888 | 1,062 | 11 | (5) | 33 | 1 | 1 | 152 | 5 | 5 |
| 1919 | 15,265 | 263 | 3,199 | | | 9 | 3 | 80 | 29 | 20 | 37 | 31 | 31 |
| 1920 | 21,296 | 304 | 4,955 | | | | | 60 | 34 | 82 | 42 | 25 | 25 |
| 1921 | 12,640 | 360 | 4,050 | | | | | 80 | 35 | 82 | 50 | 30 | 30 |
| 1922 | 20,106 | 394 | 3,400 | 10,200 | 7,000 | 4 | 35 | 81 | 44 | 175 | 60 | 45 | 45 |
| 1923 | 24,137 | 363 | 6,732 | 12,900 | 8,400 | 6 | 65 | 86 | 65 | 225 | 75 | 55 | 55 |
| 1924 | 18,100 | 387 | 5,125 | 11,600 | 8,000 | 12 | 211 | 70 | 67 | (5) | 75 | 0 | 0 |
| 1925 | 24,200 | 600 | 7,316 | 9,100 | 7,300 | 10 | 200 | 85 | 90 | 100 | 100 | 27 | 27 |
| 1926 | 28,167 | 650 | 7,712 | 10,700 | 7,800 | 20 | 340 | 75 | 75 | 75 | 150 | 42 | 42 |
| 1927 | 23,000 | 720 | 6,000 | 8,200 | 7,200 | 30 | 490 | 54 | 176 | 110 | 200 | | |
| 1928 | 38,705 | 972 | 7,900 | 15,000 | 10,500 | 68 | 772 | 99 | 211 | 38 | 220 | | |
| 1929 ⁵ | 23,600 | 1,300 | 5,900 | 9,500 | 6,500 | 128 | 1,275 | 104 | 243 | 212 | 187 | 8 | 8 |

Bureau of Agricultural Economics.

¹ The figures in this table of production include fruit consumed on farms, sold locally, and used for manufacturing purposes, as well as that shipped. The figures do not include fruit which ripened on the trees, but which was destroyed by freezing or storms prior to picking. For California the figures relate to the crop produced from the bloom of the year shown, fruiting through the winter and through the spring and summer of the following year, being picked from Nov. 1 of the year shown to Oct. 31 of the following year. Fruit not picked until after the latter date is included with the crop of the following year. For all States except California the estimates include all fruit picked after about Sept. 1 of the year shown. The estimates for oranges include tangerines.

² From prospects on Dec. 1, commercial shipments of Florida citrus fruits from the 1929 crop were estimated at 8,500,000 boxes of oranges, and 5,500,000 boxes of grapefruit, compared with 13,900,000 boxes of oranges and 9,300,000 boxes of grapefruit shipped from the 1928 crop.

³ For years 1919-1929, equivalent in standard boxes, each equal to about 2 of the "half straps" commonly used.

⁴ Census. Size of boxes not specified.

⁵ 500 boxes or less.

⁶ As estimated from prospects on Dec. 1.

TABLE 185.—*Lemons: International trade, average 1911-1913, annual 1925-1928*
(Boxes of 74 pounds)

| Country | Average 1911-1913 | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
|-------------------------------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|-------------|
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes |
| Italy | 2 | 8,147 | 1 | 7,078 | 0 | 7,008 | 0 | 7,315 | 0 | 6,609 |
| Spain | 0 | 101 | 0 | 656 | 0 | 372 | | | | |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom | 1,116 | 0 | 1,895 | 0 | 1,942 | 0 | 1,827 | 0 | 1,708 | 0 |
| United States | 1,750 | 366 | 1,572 | 162 | 999 | 296 | 849 | 308 | 953 | 251 |
| Germany | 1,107 | | 1,531 | 423 | 1,615 | 418 | 1,741 | 429 | 1,665 | 428 |
| Belgium | 763 | 0 | 825 | 43 | 898 | 44 | 95 | 44 | 1,088 | 44 |
| Czechoslovakia | | | 408 | 0 | 450 | 0 | 483 | 0 | 381 | 0 |
| Canada | | | 287 | 0 | 361 | 0 | 352 | 0 | 385 | 0 |
| Rumania | 123 | 0 | 198 | 0 | 225 | 0 | | | | |
| Poland | | | 293 | 0 | 244 | 0 | 308 | 0 | 288 | 0 |
| Netherlands | 94 | 3 | 179 | 18 | 187 | 19 | 187 | 29 | 170 | 35 |
| Switzerland | | | 140 | 0 | 146 | 0 | 153 | 0 | 165 | 0 |
| Hungary | 1,032 | 722 | 131 | 0 | 114 | 0 | 216 | 0 | 202 | 0 |
| Total 13 countries | 5,987 | 8,545 | 7,460 | 7,940 | 6,381 | 7,717 | 6,211 | 7,715 | 6,995 | 6,927 |

Bureau of Agricultural Economics. Official sources.

¹ Includes "Other citrus fruits, n. e. s.".

² 2-year average.

³ 1-year only.

⁴ Includes oranges and similar fruits.

⁵ Oranges only.

⁶ Reported in value only prior to 1925.

⁷ Average for Austria-Hungary.

TABLE 186.—*Oranges: International trade, average 1911-1913, annual 1925-1928*

[Boxes of 78 pounds]

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | Average 1911-1913 | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 boxes</i> | <i>1,000 boxes</i> | <i>1,000 boxes</i> | <i>1,000 boxes</i> | <i>1,000 boxes</i> | <i>1,000 boxes</i> | <i>1,000 boxes</i> | <i>1,000 boxes</i> | <i>1,000 boxes</i> | <i>1,000 boxes</i> |
| Spain..... | 0 | 14,830 | 0 | 20,199 | 0 | 20,265 | — | — | — | — |
| Italy..... | 3 | 3,476 | 1 | 4,077 | 1 | 3,835 | 0 | 4,410 | 0 | 2,246 |
| United States..... | ¹ 73 | 1,154 | 14 | 1,981 | 12 | 2,692 | 19 | 3,562 | 24 | 2,678 |
| Palestine..... | — | — | 0 | 1,848 | 0 | 1,885 | 0 | 2,645 | 0 | 2,151 |
| Union of South Africa..... | 0 | — | 0 | 660 | 0 | 563 | 0 | 749 | 0 | 694 |
| Brazil..... | 0 | 2 | 0 | 499 | 0 | 258 | 0 | 397 | — | — |
| Japan..... | 0 | 353 | 0 | 369 | 0 | 491 | 0 | 479 | 0 | 460 |
| China..... | — | — | 359 | 233 | 526 | 231 | 461 | 313 | — | — |
| Cuba..... | — | 111 | — | 245 | — | 322 | — | 46 | — | — |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 7,638 | 0 | 10,788 | 0 | 11,160 | 0 | 10,975 | 0 | 10,772 | 0 |
| France ² | 3,198 | 38 | 3,872 | 122 | 3,816 | 100 | 3,762 | 32 | ³ 4,142 | ³ 107 |
| Germany..... | 3,935 | — | 5,899 | — | 5,375 | — | 5,941 | — | 7,340 | — |
| Canada ⁴ | — | — | 1,167 | 0 | 2,133 | 0 | 2,544 | 0 | 2,212 | 0 |
| Netherlands..... | 631 | 9 | 1,850 | 561 | 1,717 | 456 | 1,631 | 527 | 1,938 | 666 |
| Belgium ⁵ | — | — | — | 871 | — | 671 | — | — | — | — |
| Egypt..... | — | 0 | 501 | 3 | 315 | 3 | 393 | 4 | 250 | 5 |
| Poland..... | — | — | 638 | 0 | 177 | 1 | 210 | 0 | 134 | 0 |
| Switzerland..... | 372 | 0 | 374 | 0 | 437 | 0 | 419 | 0 | 494 | 0 |
| Norway ¹ | 208 | 0 | 338 | 0 | 369 | 0 | 387 | 0 | 426 | 0 |
| Sweden..... | 166 | 0 | 265 | 0 | 320 | 0 | 360 | 0 | 399 | 0 |
| Denmark..... | 97 | 0 | 230 | 0 | 229 | 0 | 224 | 0 | 256 | 0 |
| Czechoslovakia..... | — | — | 430 | 0 | 460 | 0 | 417 | 0 | 384 | 0 |
| Irish Free State..... | — | — | 234 | 0 | 244 | 0 | 255 | 0 | 258 | 0 |
| Hungary..... | ⁶ 2,110 | ⁶ 102 | 236 | 0 | 220 | 0 | 350 | 0 | 360 | 0 |
| Total 24 countries..... | 18,431 | 20,075 | 27,196 | 30,797 | 28,388 | 31,102 | 29,019 | 13,164 | 29,389 | 9,007 |

Bureau of Agricultural Economics. Official sources.

¹ 2-year average.² Includes lemons.³ Oranges only.⁴ Reported in value only prior to 1925.⁵ Included with lemons except for 1926 and 1927 imports.⁶ Average for Austria-Hungary.TABLE 187.—*Grapefruit, Florida: Weighted average auction price per box, New York, by months, 1924-1929*

| Season beginning October | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Average |
|--------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1924..... | — | — | — | 2.83 | 2.83 | 2.71 | 3.78 | 4.38 | 5.94 | — | — |
| 1925..... | 4.96 | 3.97 | 3.95 | 4.01 | 4.03 | 4.61 | 5.16 | 4.70 | 4.74 | 5.51 | 4.38 |
| 1926..... | 5.35 | 4.07 | 3.40 | 3.58 | 3.75 | 3.67 | 3.59 | 3.66 | 3.80 | 2.44 | 3.66 |
| 1927..... | 4.60 | 4.70 | 4.71 | 4.82 | 5.07 | 5.52 | 5.45 | 4.92 | 3.93 | 6.28 | ¹ 4.93 |
| 1928..... | 4.71 | 4.15 | 3.44 | 3.52 | 3.20 | 3.30 | 3.32 | 3.83 | 4.71 | 6.36 | 3.70 |
| 1929..... | 4.51 | 4.23 | 4.26 | — | — | — | — | — | — | — | — |

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those formerly published in Yearbooks.

¹ Reported for one week only.

Includes a price in August of \$4.51.

TABLE 188.—Lemons, California: Weighted average auction price per box, New York, by months, 1924-1929

| Season beginning November | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Average |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1924 | | | 4.47 | 4.45 | 4.59 | 4.75 | 5.73 | 6.84 | 4.66 | 4.67 | 8.55 | 6.83 | |
| 1925 | 4.13 | 4.46 | 3.91 | 4.16 | 5.40 | 4.12 | 4.83 | 3.79 | 4.83 | 4.38 | 3.56 | 4.50 | 4.35 |
| 1926 | 3.82 | 4.03 | 4.20 | 3.43 | 3.90 | 3.50 | 3.89 | 4.50 | 6.44 | 6.37 | 8.82 | 9.27 | 4.64 |
| 1927 | 6.92 | 6.13 | 6.33 | 6.03 | 5.19 | 5.51 | 6.12 | 6.04 | 6.97 | 6.11 | 5.59 | 5.08 | 6.08 |
| 1928 | 5.04 | 5.62 | 5.26 | 3.95 | 4.07 | 4.55 | 3.82 | 6.89 | 5.39 | 7.82 | 11.87 | 11.22 | 5.82 |
| 1929 | 8.70 | 8.63 | | | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those formerly published in Yearbooks.

TABLE 189.—Oranges, California navels: Weighted average auction price per box, New York, by months, 1924-1929

| Season beginning November | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Average |
|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| 1924 | | | 4.64 | 4.47 | 5.30 | 5.18 | 6.51 | 6.24 | |
| 1925 | 8.00 | 4.56 | 4.24 | 4.55 | 4.70 | 5.50 | 4.73 | 5.56 | 4.80 |
| 1926 | 6.32 | 5.06 | 4.69 | 4.71 | 4.51 | 4.89 | 4.43 | 5.60 | 4.74 |
| 1927 | (1) | 5.55 | 4.56 | 5.18 | 5.52 | 5.98 | 7.39 | | |
| 1928 | 5.72 | 4.16 | 1.84 | 3.89 | 3.52 | 4.06 | 3.56 | 3.56 | 4.10 |
| 1929 | (1) | 5.56 | | | | | | | |

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those formerly published in Yearbooks.

¹ Reported for one week only.

TABLE 190.—Oranges, California valencias: Weighted average auction price per box, New York, by months, 1925-1929

| Season beginning April | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Average ¹ |
|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------|
| | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| 1925 | 4.80 | 6.28 | 7.43 | 6.40 | 6.47 | 7.58 | 8.23 | 9.90 | 7.15 |
| 1926 | 4.92 | 1.54 | 4.16 | 5.21 | 1.89 | 5.39 | 6.14 | 6.79 | 5.28 |
| 1927 | 4.66 | 4.13 | 4.98 | 5.90 | 6.15 | 6.73 | 7.02 | 6.71 | 6.00 |
| 1928 | 5.94 | 7.38 | 7.22 | 7.58 | 7.15 | 7.77 | 7.53 | 7.15 | 7.45 |
| 1929 | (2) | 4.40 | 4.58 | 4.13 | 4.87 | 4.73 | 4.85 | 4.77 | 4.63 |

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those formerly published in Yearbooks.

¹ Includes prices in December as follows: 1925, \$2.14; 1926, \$6.69; 1927, \$5.75.

² Reported for one week only.

TABLE 191.—Oranges, Florida: Weighted average auction price per box, New York by months, 1924-1929

| Season beginning October— | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Average ¹ |
|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------|
| | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| 1924 | | | | 3.68 | 4.26 | 5.69 | 6.13 | 7.82 | 8.26 | |
| 1925 | 7.45 | 7.19 | 4.00 | 4.25 | 4.44 | 5.02 | 5.80 | 5.87 | 6.72 | 5.10 |
| 1926 | 3.70 | 4.79 | 3.53 | 3.76 | 3.91 | 4.10 | 4.85 | 4.75 | 4.54 | 4.11 |
| 1927 | 3.67 | 6.31 | 5.59 | 5.23 | 5.97 | 6.29 | 6.84 | 8.58 | 9.11 | 6.24 |
| 1928 | 4.12 | 3.83 | 3.55 | 3.45 | 3.30 | 3.30 | 3.55 | 3.33 | 2.99 | 3.40 |
| 1929 | 3.42 | 4.04 | 4.21 | | | | | | | |

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those formerly published in Year books.

¹ Includes prices in other months as follows: 1924, \$8.49 in July; 1926, \$3.12 in July; 1928, \$2.92 in July, and \$2.20 in August.

TABLE 192.—*Cherries: Commercial production, by States, imports and exports, 1923-1929*

| Year | Commercial production | | | | | | | | | | Imports, year beginning July 1 | | | Exports, year beginning July 1, canned ¹ |
|-------------------------|-----------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------------------------|-----------------------|--------------|---|
| | New York | Wisconsin | Montana | Idaho | Colorado | Utah | Washington | Oregon | California | 9 States | Natural, in brine | Prepared or preserved | Total | |
| | Short tons | Short tons | Short tons | Short tons | Short tons | Short tons | Short tons | Short tons | Short tons | Short tons | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1000 pounds |
| 1923..... | 12,843 | | | | 5,500 | | | | | | 2,970 | 1,380 | 4,350 | 1,675 |
| 1924..... | 15,356 | 8,825 | 225 | 2,600 | 650 | 3,800 | | | 13,500 | 44,956 | 4,937 | 9,175 | 14,112 | 1,612 |
| 1925..... | 14,656 | 3,150 | 270 | 3,200 | 3,600 | 5,500 | | | 12,000 | 48,626 | 2,904 | 11,153 | 14,057 | 1,688 |
| 1926..... | 15,857 | 8,938 | 336 | 3,900 | 7,000 | 5,300 | 9,100 | 14,000 | 20,000 | 84,431 | 5,733 | 15,974 | 21,707 | 2,111 |
| 1927..... | 9,851 | 2,812 | 300 | 2,200 | 4,200 | 3,800 | 3,100 | 10,500 | 12,000 | 48,763 | 15,136 | 1,048 | 16,184 | 1,719 |
| 1928..... | 8,409 | 9,500 | 120 | 4,100 | 1,500 | 4,600 | 8,500 | 11,500 | 18,500 | 66,729 | 13,194 | 384 | 13,578 | 2,202 |
| 1929 ² | 12,734 | 4,375 | 260 | 4,000 | 4,500 | 4,000 | 7,500 | 8,400 | 16,000 | 61,769 | | | | |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board

¹ Fresh cherries not separately reported.² Beginning Jan. 1, 1924.³ Preliminary.TABLE 193.—*Cranberries: Production and farm value, United States, 1914-1929*

| Year | Production | Price per barrel received by producers, Dec. 1 | Farm value | Year | Production | Price per barrel received by producers, Dec. 1 | Farm value |
|-----------|-------------|--|--------------|-------------------------|-------------|--|--------------|
| | 1,000 bbls. | Dollars | 1,000 dolls. | | 1,000 bbls. | Dollars | 1,000 dolls. |
| 1914..... | 697 | 3.97 | 2,766 | 1922..... | 550 | 10.18 | 5,702 |
| 1915..... | 441 | 6.59 | 2,908 | 1923..... | 652 | 7.15 | 4,664 |
| 1916..... | 471 | 7.32 | 3,449 | 1924..... | 582 | 9.42 | 5,485 |
| 1917..... | 249 | 10.24 | 2,550 | 1925..... | 569 | 11.20 | 6,370 |
| 1918..... | 352 | 10.77 | 3,791 | 1926..... | 744 | 7.55 | 5,623 |
| 1919..... | 549 | 8.37 | 4,597 | 1927..... | 496 | 12.28 | 6,089 |
| 1920..... | 419 | 12.24 | 5,114 | 1928..... | 551 | 14.51 | 7,997 |
| 1921..... | 384 | 16.99 | 6,526 | 1929 ¹ | 542 | 13.09 | 7,088 |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board. Price are based upon returns from crop reporters.

¹ Preliminary.TABLE 194.—*Cranberries: Production and December 1 price, by States, 1924-1929*

| State | Production | | | | | | Price per barrel received by producers Dec. 1 | | | | | |
|--------------------|------------|---------|---------|---------|---------|-------------------|---|--------|--------|--------|--------|--------|
| | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ¹ | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | Bbls. | Bbls. | Bbls. | Bbls. | Bbls. | Bbls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| Massachusetts..... | 325,000 | 429,000 | 430,000 | 370,000 | 335,000 | 395,000 | 9.90 | 11.25 | 7.75 | 12.50 | 15.00 | 13.25 |
| New Jersey..... | 215,000 | 115,000 | 210,000 | 75,000 | 138,000 | 90,000 | 8.75 | 10.75 | 7.00 | 11.00 | 13.00 | 12.00 |
| Wisconsin..... | 42,000 | 25,000 | 80,000 | 24,000 | 50,000 | 42,000 | 9.20 | 12.32 | 8.00 | 13.50 | 16.00 | 13.50 |
| Washington..... | | | 16,600 | 21,000 | 22,000 | 9,500 | | | 7.80 | 12.00 | 13.50 | 14.25 |
| Oregon..... | | | 7,000 | 6,000 | 6,000 | 5,000 | | | 7.50 | 10.50 | 13.50 | 14.50 |
| United States.. | 582,000 | 569,000 | 743,600 | 496,000 | 551,000 | 541,500 | 9.42 | 11.20 | 7.56 | 12.28 | 14.51 | 13.09 |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board. Prices are based upon returns from crop reporters.

¹ Preliminary.

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TABLE 195.—Cranberries: Car-lot shipments, by State of origin, 1920-1928

| State | Crop movement season ¹ | | | | | | | | |
|--------------------|-----------------------------------|-------------|-------------|-------------|-------------|--------------------|-------------|-------------|-------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 ² |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| Massachusetts..... | 960 | 644 | 999 | 1,324 | 1,045 | ³ 1,457 | 3,762 | 1,242 | 1,050 |
| New Jersey..... | 452 | 637 | 780 | 713 | 806 | 427 | 804 | 290 | 478 |
| Wisconsin..... | 82 | 68 | 223 | 140 | 150 | 73 | 309 | 80 | 171 |
| Other States..... | 2 | 4 | 5 | 6 | 12 | 40 | 34 | 116 | 82 |
| Total..... | 1,502 | 1,353 | 2,016 | 2,183 | 2,013 | ³ 1,997 | 4,909 | 1,728 | 1,781 |

Bureau of Agricultural Economics. Compiled from monthly reports received by the bureau from local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat, reduced to car-lot basis.

¹ Crop movement season extends from Sept. 1 of one year through April of the following year.

² Preliminary.

³ Includes 1 car in August.

TABLE 196.—Grapes: Production, farm price, imports and exports, 1922-1929

| Year | Production | Seasonal farm price per ton ¹ | Value, basis seasonal farm price ¹ | Foreign trade, year beginning July 1 ² | | | |
|-------------------------|------------------------|--|---|---|-------------------|--------------------------|--------------------------|
| | | | | Domestic exports | Imports | Net exports ³ | |
| | | | | | | Total | Percentage of production |
| | <i>Short tons</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Per cent</i> |
| 1922..... | 1,981,171 | 48.09 | 95,271,520 | 7,011 | 16,326 | ⁴ 9,315 | |
| 1923..... | 2,227,395 | 31.88 | 71,009,078 | 10,128 | 10,015 | 198 | (⁵) |
| 1924..... | 1,777,722 | 41.79 | 74,297,480 | 10,151 | 1,608 | 8,566 | 0.5 |
| 1925..... | ⁶ 2,202,085 | 32.03 | 66,115,000 | 12,134 | 1,415 | 10,735 | .5 |
| 1926..... | ⁶ 2,438,413 | 26.66 | 64,604,000 | 15,396 | 1,011 | 14,414 | .6 |
| 1927..... | ⁶ 2,605,238 | 26.52 | 65,332,000 | 19,410 | 1,735 | 17,747 | .7 |
| 1928..... | ⁶ 2,671,076 | 19.75 | 49,740,000 | 27,819 | 1,703 | 26,155 | |
| 1929 ⁷ | 2,022,417 | 29.36 | 59,387,000 | | | | |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board. Prices are based upon returns from crop reporters.

¹ For years 1925-1929, the average price for the States reporting price, except California, is used for computing the value of the grape crop in the less important States for which no price is determined. Price and value are based on quantities actually harvested.

² Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1923-1926; January and June issues, 1927-1929.

³ Total exports (domestic plus foreign) minus total imports.

⁴ Net imports equals total imports minus total exports (domestic plus foreign).

⁵ Less than 0.05 per cent.

⁶ Includes some quantities not harvested in California as follows: 138,000 tons in 1925, 15,000 in 1926, 142,000 in 1927, and 153,000 in 1928.

⁷ Preliminary.

TABLE 197.—*Grapes: Estimated production, by States, 1926-1929*

| State and division | 1926 | 1927 | 1928 | 1929 ¹ | State and division | 1926 | 1927 | 1928 | 1929 ¹ |
|---------------------|-------------|-------------|-------------|-------------------|---------------------|------------------------|------------------------|------------------------|-------------------|
| <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | |
| Me..... | 49 | 58 | 76 | 81 | Ga..... | 1,892 | 1,472 | 1,672 | 1,430 |
| N. H..... | 96 | 91 | 91 | 130 | Fla..... | 700 | 610 | 900 | 888 |
| Vt..... | 36 | 45 | 36 | 56 | South Atlantic..... | 18,569 | 13,957 | 17,079 | 15,447 |
| Mass..... | 616 | 555 | 476 | 714 | Ky..... | 1,271 | 632 | 1,200 | 912 |
| R. I..... | 212 | 152 | 190 | 230 | Tenn..... | 1,672 | 950 | 1,368 | 1,251 |
| Conn..... | 1,275 | 1,087 | 1,314 | 1,620 | Ala..... | 913 | 627 | 759 | 759 |
| N. Y..... | 106,700 | 51,520 | 85,470 | 81,030 | Miss..... | 300 | 225 | 259 | 245 |
| N. J..... | 2,820 | 2,535 | 2,822 | 2,652 | Ark..... | 13,000 | 3,000 | 17,000 | 13,800 |
| Pa..... | 25,110 | 14,850 | 22,680 | 16,200 | La..... | 42 | 80 | 38 | 36 |
| North Atlantic..... | 136,914 | 70,893 | 113,155 | 102,722 | Okla..... | 1,800 | 1,732 | 2,106 | 2,070 |
| Ohio..... | 29,100 | 20,000 | 28,700 | 17,156 | Tex..... | 1,200 | 1,260 | 1,440 | 1,520 |
| Ind..... | 4,606 | 2,580 | 4,980 | 8,780 | South Central..... | 20,201 | 8,456 | 24,164 | 20,596 |
| Ill..... | 6,532 | 3,440 | 6,800 | 6,160 | Idaho..... | 309 | 301 | 298 | 272 |
| Mich..... | 60,900 | 51,700 | 72,800 | 68,870 | Colo..... | 320 | 314 | 357 | 374 |
| Wis..... | 409 | 250 | 495 | 434 | N. Mex..... | 531 | 458 | 600 | 608 |
| Minn..... | 85 | 152 | 198 | 166 | Ariz..... | 900 | 1,900 | 1,785 | 1,890 |
| Iowa..... | 6,052 | 5,329 | 6,225 | 6,675 | Utah..... | 1,300 | 1,320 | 1,520 | 1,660 |
| Mo..... | 12,880 | 7,000 | 14,000 | 12,045 | Nev..... | 230 | 270 | 210 | 252 |
| Nebr..... | 1,584 | 1,955 | 1,920 | 2,125 | Wash..... | 2,500 | 3,200 | 4,300 | 4,700 |
| Kans..... | 3,700 | 3,735 | 3,465 | 3,375 | Oreg..... | 1,800 | 2,025 | 2,025 | 2,116 |
| North Central..... | 125,848 | 96,141 | 139,583 | 120,780 | Calif..... | ² 2,129,009 | ² 2,406,000 | ² 2,366,000 | 1,751,000 |
| Del..... | 1,536 | 1,207 | 1,609 | 1,710 | Far western..... | 2,136,881 | 2,415,791 | 2,377,095 | 1,762,872 |
| Md..... | 1,330 | 1,225 | 1,200 | 1,314 | U. S..... | 2,438,413 | 2,605,238 | 2,671,076 | 2,022,417 |
| Va..... | 2,790 | 2,048 | 2,560 | 2,336 | | | | | |
| W. Va..... | 1,696 | 720 | 1,422 | 954 | | | | | |
| N. C..... | 6,840 | 5,135 | 6,000 | 5,320 | | | | | |
| S. C..... | 1,785 | 1,540 | 1,725 | 1,495 | | | | | |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.² The totals shown for California include 15,000 tons not harvested in 1926, 142,000 tons not harvested in 1927, and 153,000 tons not harvested in 1928.TABLE 198.—*Grapes: Car-lot shipments, by State of origin, 1920-1929*Crop movement season ¹

| State | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ² |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York ² | 5,901 | 2,535 | 7,720 | 4,312 | 5,611 | 3,763 | 7,242 | 3,050 | 3,752 | 2,422 |
| Pennsylvania..... | 1,223 | 390 | 1,558 | 847 | 1,166 | 589 | 1,350 | 689 | 1,076 | 877 |
| Michigan..... | 5,046 | 1,292 | 6,020 | 4,202 | 4,680 | 398 | 3,081 | 2,023 | 1,571 | 1,695 |
| Iowa..... | 104 | 77 | 237 | 217 | 79 | 50 | 176 | 196 | 234 | 309 |
| Missouri..... | 27 | 4 | 128 | 58 | 101 | 166 | 686 | 108 | 415 | 215 |
| Arkansas..... | 14 | 3 | 38 | 33 | 243 | 394 | 1,170 | 108 | 998 | 510 |
| Washington..... | 8 | 64 | 47 | 62 | 83 | 191 | 125 | 167 | 235 | 218 |
| California ² | 28,832 | 33,344 | 43,952 | 55,348 | 57,695 | 76,066 | 61,327 | 75,925 | 73,157 | 58,502 |
| Other States..... | 152 | 108 | 219 | 257 | 245 | 261 | 433 | 411 | 332 | 369 |
| Total ² | 41,310 | 37,817 | 59,919 | 65,336 | 69,933 | 81,878 | 78,590 | 82,677 | 81,770 | 65,117 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop movement season extends from June 1 through December of a given year.² Preliminary.³ Figures for certain States include shipments in succeeding crop year as follows: California, 1920, January, 1 car; 1921, January, 2 cars; 1922, January, 7 cars; 1923, January, 13 cars; 1924, January, 6 cars; February, 2 cars; 1925, January, 21 cars; 1926, January, 2 cars; February, 1 car; 1927, January, 7 cars; February, 2 cars; 1928, January, 31 cars; February, 8 cars; March, 1 car; New York, 1928, January, 1 car; February, 1 car.

TABLE 199.—*Grapes: Weighted seasonal averages of auction sales of California grapes in 11 markets,¹ 1925-1929*

| Variety | Unit | Packages | | | | | Average price per package | | | | |
|---------------------------------------|---------------|-------------------|-------------------|-------------------|-------------------|----------------|---------------------------|-------------------|-------------------|-------------------|--------------|
| | | 1925 ² | 1926 ³ | 1927 ⁴ | 1928 ⁵ | 1929 | 1925 ² | 1926 ³ | 1927 ⁴ | 1928 ⁵ | 1929 |
| | | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Dol- lars | Dol- lars | Dol- lars | Dol- lars | Dol- lars |
| Alicante Bouschet..... | Lug..... | 2,611 | 3,167 | 4,475 | 4,968 | 4,759 | 2.02 | 1.65 | 1.59 | 1.22 | 1.29 |
| Carignane..... | do..... | 795 | 774 | 1,313 | 1,710 | 542 | 1.48 | 1.47 | 1.32 | 1.06 | 1.14 |
| Cornichon..... | Crate..... | 352 | 229 | 189 | 57 | 25 | 1.35 | 1.27 | 1.20 | 1.15 | 1.22 |
| Do..... | Lug..... | 401 | 396 | 386 | 498 | 289 | 1.23 | 1.20 | 1.15 | 1.04 | 1.27 |
| Emperor..... | Crate..... | 206 | 107 | 67 | 10 | ----- | 1.10 | 1.39 | 1.11 | 1.04 | ----- |
| Do..... | Lug..... | 239 | 226 | 169 | 92 | 56 | .96 | 1.38 | 1.16 | 1.16 | 1.62 |
| Malaga..... | Crate..... | 1,872 | 1,544 | 1,214 | 517 | 123 | 1.36 | 1.28 | 1.28 | 1.24 | 1.33 |
| Do..... | Lug..... | 2,339 | 2,193 | 2,505 | 2,611 | 1,903 | 1.03 | 1.11 | 1.19 | 1.16 | 1.37 |
| Mataro..... | do..... | 340 | 193 | 209 | 319 | 193 | 1.68 | 1.37 | 1.30 | .96 | 1.14 |
| Mission..... | do..... | 1,039 | 490 | 530 | 585 | 270 | 1.12 | 1.31 | 1.06 | .88 | 1.23 |
| Muscat (type)..... | do..... | 3,117 | 2,429 | 4,660 | 4,888 | 2,754 | .97 | 1.02 | 1.02 | .81 | 1.06 |
| Petit Syrah..... | do..... | 220 | 244 | 316 | 365 | 257 | 1.41 | 1.27 | 1.35 | .96 | 1.15 |
| Sultanina (Thompson Seedless)..... | Crate..... | 1,537 | 866 | 1,081 | 479 | 261 | 1.31 | 1.24 | 1.42 | 1.03 | 1.48 |
| Do..... | Lug..... | 2,488 | 886 | 1,450 | 2,003 | 2,458 | 1.04 | 1.09 | 1.31 | 1.05 | 1.48 |
| Flame Tokay..... | Crate..... | 881 | 726 | 678 | 241 | 157 | 1.37 | 1.50 | 1.46 | 1.51 | 1.55 |
| Do..... | Lug..... | 2,327 | 1,769 | 2,107 | 2,520 | 1,698 | 1.13 | 1.40 | 1.38 | 1.32 | 1.41 |
| Zinfandel..... | do..... | 1,385 | 1,017 | 1,592 | 1,679 | 1,402 | 1.54 | 1.22 | 1.30 | 1.00 | 1.14 |
| Total..... | Packages..... | 22,149 | 17,265 | 23,401 | 23,550 | 17,147 | ----- | ----- | ----- | ----- | 1.36 |

Bureau of Agricultural Economics. Compiled from daily reports of the fruit and vegetable market news service. Principal varieties only shown.

¹ Baltimore, Boston, Chicago, Cincinnati, Cleveland, Detroit, Minneapolis, New York, Philadelphia, Pittsburgh, and St. Louis.

² Aug. 3 to Nov. 14.

³ Aug. 5 to Nov. 6.

⁴ Aug. 2 to Nov. 12.

⁵ July 19 to Nov. 30.

TABLE 200.—*Grapes: Average l. c. l. price to jobbers, specified markets, October 1924-1929*

| Year | New York Concord, 12-quart baskets | | | | Michigan Concord, 4-quart baskets | | |
|-----------|------------------------------------|----------|-------------------|-----------------|-----------------------------------|------------------|-----------|
| | Boston | New York | Phila- delphia | Pitts- burgh | Chicago | Minne- apolis | St. Louis |
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1924..... | 91 | 84 | 90 | 85 | 28 | ----- | 30 |
| 1925..... | 102 | 114 | 104 | 109 | 43 | 46 | 39 |
| 1926..... | 61 | 62 | 56 | 60 | 18 | 27 | 22 |
| 1927..... | 56 | 61 | 64 | 64 | 25 | 30 | 27 |
| 1928..... | 60 | 54 | 49 | 51 | 21 | 26 | 23 |
| 1929..... | 50 | 54 | 51 | 48 | 20 | 25 | 23 |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

TABLE 201.—Olive oil (including inedible): International trade, average 1909–1913, annual 1925–1928

| Country | Year ended Dec. 31 | | | | | | | | | |
|---------------------------------------|---------------------------------|---------------------|--------------------|--------------------|---------------------|--------------------|---------------------|----------------|-------------------|--------------|
| | Average, 1909–1913 ¹ | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Principal exporting countries: | | | | | | | | | | |
| Spain..... | 30 | 86,454 | 3 | 112,990 | 9 | 213,186 | | | | |
| Italy..... | ² 6,643 | 75,130 | 662 | 94,901 | 3,141 | 52,044 | 1,220 | 76,527 | 3,508 | 29,747 |
| Greece..... | 0 | 22,272 | 181 | 59,437 | 0 | 9,733 | 0 | 20,389 | 0 | 16,715 |
| Tunis..... | 2,020 | 18,090 | 3,694 | 37,071 | 613 | 49,012 | 496 | 56,707 | 2,472 | 30,818 |
| Algeria..... | ³ 974 | ¹ 11,566 | 153 | 25,254 | 139 | 27,288 | 85 | 13,190 | 38 | 48,096 |
| Portugal..... | ² 2,020 | ² 5,492 | ² 2,254 | ³ 3,957 | ³ 4,709 | ³ 4,375 | | | | |
| Yugoslavia..... | 0 | 0 | 1,015 | 455 | 1,012 | 281 | 559 | 1,289 | 1,319 | 1,120 |
| Morocco..... | 267 | 375 | 219 | 57 | 279 | 3,656 | 306 | 142 | | |
| Principal importing countries: | | | | | | | | | | |
| United States..... | 39,903 | 0 | 142,133 | 0 | 128,731 | 0 | 124,151 | 0 | 131,213 | 0 |
| Argentina..... | 48,248 | 0 | 79,705 | ³ 0 | ³ 91,174 | ³ 0 | ³ 77,066 | ³ 0 | | |
| France..... | ² 42,502 | 12,935 | 37,859 | 9,112 | 45,930 | 11,670 | 29,855 | 18,643 | 43,803 | 19,123 |
| United Kingdom..... | 22,950 | 823 | 17,270 | 291 | 17,983 | 325 | 18,980 | 392 | 20,745 | 253 |
| Cuba..... | 0 | 0 | 17,273 | 0 | 17,319 | 0 | | | | |
| Uruguay..... | 4,249 | 0 | 12,738 | 0 | 13,618 | 0 | 10,326 | 0 | | |
| Chile..... | 7,255 | 0 | 9,222 | 0 | ³ 14,590 | ³ 0 | ³ 13,998 | ³ 0 | | |
| Brazil..... | 8,409 | 0 | 13,207 | 0 | 11,262 | 0 | 9,661 | 0 | 20,005 | 0 |
| Macao (Portuguese China)..... | 0 | 0 | 10,275 | 3,191 | 5,302 | 3,437 | | | | |
| Norway..... | 3,458 | 33 | 4,722 | 0 | 6,148 | 0 | 7,006 | 0 | 7,163 | 0 |
| Palestine..... | 0 | 0 | 5,039 | 248 | 3,627 | 325 | 4,421 | 2,140 | 8,310 | 454 |
| Switzerland..... | 4,138 | 71 | 3,542 | 0 | 3,355 | 0 | 2,881 | 7 | 3,734 | 0 |
| Egypt..... | 4,803 | 0 | 3,344 | 34 | 2,934 | 38 | 1,911 | 29 | 2,196 | 33 |
| Bulgaria..... | 4,003 | 7 | 2,576 | 0 | 1,397 | 0 | 1,021 | 0 | 570 | 0 |
| Canada..... | ² 1,593 | 0 | 2,378 | 0 | 3,532 | 0 | 4,448 | 0 | 5,132 | 0 |
| Belgium..... | ² 4,295 | ³ 582 | 1,829 | 52 | 1,528 | 36 | 797 | 17 | 1,314 | 47 |
| Germany..... | 6,085 | 0 | 3,362 | 35 | 1,837 | 34 | 2,438 | 50 | 2,919 | 55 |
| Rumania..... | 7,328 | 0 | 2,016 | 0 | 1,901 | 1 | | | | |
| Australia..... | 510 | 11 | ³ 1,121 | ³ 0 | ³ 1,413 | ³ 1 | ³ 1,351 | ³ 1 | | |
| Peru..... | ² 684 | ² 77 | 1,011 | 0 | 1,238 | 0 | 917 | 0 | | |
| Czechoslovakia..... | 0 | 0 | 721 | 17 | 966 | 36 | 911 | 62 | 1,120 | 4 |
| Sweden..... | 889 | 2 | 498 | 3 | 405 | 5 | 312 | 4 | 453 | 4 |
| Japan..... | 126 | 0 | 316 | 0 | 357 | 0 | 309 | 0 | | |
| Philippine Islands..... | 360 | 0 | 266 | 0 | 348 | 0 | 328 | 0 | | |
| Netherlands..... | ² 232 | ³ 205 | 191 | 8 | 171 | 5 | 150 | 17 | 209 | 4 |
| Denmark..... | 146 | 0 | 150 | 6 | 101 | 5 | 209 | 4 | | |
| New Zealand..... | 68 | 0 | 150 | 0 | 136 | 0 | 141 | 0 | 273 | 0 |
| Total 35 countries..... | 224,238 | 234,125 | 381,185 | 347,119 | 387,205 | 375,493 | 316,244 | 189,610 | 266,828 | 146,473 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. Conversions made on the basis of 7.5 pounds to the gallon.

¹ International Institute of Agriculture, "Oleaginous Products and Vegetable Oils."

² 4-year average.

³ International Yearbook of Agricultural Statistics.

TABLE 202.—*Peaches: Total production, foreign trade in the United States, and average price per bushel, years 1913-1929*

| Year | Production | Price per bushel, received by producers ¹ | Farm value | Domestic exports, year beginning July 1 ¹ | | | |
|-------------------------|---------------|--|---------------|--|--------------|---------------------|-------------------------|
| | | | | Fresh | Dried | Canned ³ | Total in terms of fresh |
| | 1,000 bushels | Dollars | 1,000 dollars | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 bushels |
| 1913..... | 39,707 | | | | 6,712 | | 736 |
| 1914..... | 54,109 | | | | 14,465 | | 1,586 |
| 1915..... | 64,097 | | | | 13,739 | | 1,507 |
| 1916..... | 37,505 | | | | 8,188 | | 898 |
| 1917..... | 48,765 | | | | 5,863 | | 643 |
| 1918..... | 33,094 | 1.62 | 53,637 | | 4,835 | | 530 |
| 1919..... | 50,686 | | | | | | |
| 1919..... | 53,178 | 1.89 | 100,485 | | 12,756 | | 1,399 |
| 1920..... | 45,620 | 2.10 | 95,970 | | 3,573 | | 392 |
| 1921..... | 32,602 | 1.59 | 51,739 | 4,611 | 6,260 | | 699 |
| 1922..... | 55,852 | 1.34 | 74,717 | 13,170 | 5,586 | 54,624 | 3,163 |
| 1923..... | 45,382 | 1.37 | 62,025 | 15,065 | 12,975 | 50,374 | 3,835 |
| 1924..... | 47,755 | | | | | | |
| 1924..... | 53,848 | 1.26 | 68,064 | 16,172 | 4,608 | 57,390 | 3,240 |
| 1925..... | 46,562 | 1.38 | 64,171 | 15,749 | 3,351 | 83,160 | 4,161 |
| 1926..... | 69,865 | 1.00 | 68,426 | 14,453 | 6,968 | 81,896 | 4,477 |
| 1927..... | 45,463 | 1.18 | 50,494 | 17,969 | 6,542 | 86,634 | 4,701 |
| 1928..... | 68,369 | .99 | 63,643 | 22,067 | 12,436 | 101,438 | 6,050 |
| 1929 ⁴ | 45,998 | 1.36 | 62,705 | | | | |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns. Prices based upon returns from crop reporters.

¹ Dried peaches converted to terms of fresh on the basis that dried peaches equal 19 per cent of fresh. Canned peaches converted to terms of fresh on the basis that 25 pounds of fresh equal 1 dozen cans of 1 pound each; 48 pounds fresh equals 1 bushel. In practice, 1 bushel of fresh fruit is figured as the equivalent of 2 dozen cans of 1 pound each.

² From 1918 to 1922, Sept. 15 price; 1923-1925, Sept. 15 price in North, Aug. 15 price in South; 1926-1929, approximate average price for the season, as reported Dec. 1.

³ Canned peaches were reported in value only prior to July 1, 1922.

⁴ No exports reported prior to Jan. 1, 1922. Figures for 1921 represent exports Jan. 1, 1922, to June 30, 1922.

⁵ For quantities not harvested in 1926, 1927, and 1928 see Table 203.

⁶ Preliminary.

TABLE 203.—*Peaches: Production and seasonal farm price, by States, 1923-1929*

| State and division | Production | | | | | | | Seasonal farm price per bushel ¹ | | | | | | |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|---|----------|----------|----------|----------|----------|----------|
| | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ² | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | Dol-lars | Dol-lars | Dol-lars | Dol-lars | Dol-lars | Dol-lars | Dol-lars |
| New Hampshire..... | 40 | | 34 | 29 | 26 | 25 | 26 | 1.62 | ..... | 2.00 | 1.50 | 2.20 | 2.40 | 2.00 |
| Massachusetts..... | 205 | 40 | 218 | 213 | 140 | 189 | 165 | 2.70 | 2.30 | 2.50 | 1.80 | 2.10 | 2.30 | 2.10 |
| Rhode Island..... | 31 | 29 | 30 | 37 | 23 | 27 | 25 | 1.95 | 2.30 | 3.00 | 1.70 | 2.10 | 2.30 | 2.50 |
| Connecticut..... | 232 | 220 | 210 | 255 | 186 | 239 | 177 | 2.64 | 2.10 | 2.80 | 1.70 | 2.20 | 1.90 | 2.00 |
| New York..... | 1,700 | 2,178 | 1,920 | 2,300 | 1,140 | 2,400 | 1,470 | 1.81 | 1.93 | 1.90 | .90 | 1.80 | 1.45 | 1.80 |
| New Jersey..... | 2,642 | 2,500 | 1,740 | 3,000 | 2,304 | 1,625 | 2,600 | 2.09 | 1.79 | 1.50 | .70 | 1.50 | 1.35 | 1.15 |
| Pennsylvania..... | 1,907 | 1,715 | 600 | 2,498 | 947 | 1,867 | 1,157 | 1.83 | 1.91 | 2.40 | 1.00 | 1.55 | 2.00 | 1.75 |
| North Atlantic..... | 6,757 | 6,682 | 4,752 | 8,332 | 4,766 | 6,372 | 5,620 | 1.98 | 1.88 | 1.89 | .92 | 1.75 | 1.50 | 1.51 |
| Ohio..... | 1,386 | 800 | 1,100 | 2,120 | 1,326 | 1,742 | 494 | 1.87 | 2.05 | 2.15 | 1.25 | 1.95 | 1.55 | 1.95 |
| Indiana..... | 445 | 240 | 320 | 900 | 242 | 605 | 726 | 2.31 | 2.20 | 2.30 | 1.60 | 2.35 | 1.60 | 1.60 |
| Illinois..... | 675 | 700 | 500 | 2,660 | 1,122 | 1,638 | 3,000 | 2.64 | 2.20 | 2.50 | 1.25 | 2.05 | 1.40 | 1.45 |
| Michigan..... | 1,125 | 464 | 592 | 1,564 | 578 | 1,156 | 816 | 1.79 | 2.30 | 2.20 | 1.00 | 2.10 | 1.55 | 1.90 |
| Iowa..... | 40 | 3 | 12 | 97 | 65 | 50 | 55 | 2.00 | 2.60 | 2.50 | 1.60 | 1.95 | 1.50 | 1.50 |
| Missouri..... | 1,040 | 860 | 870 | 1,722 | 340 | 655 | 1,281 | 1.74 | 1.40 | 1.80 | 1.25 | 1.90 | 1.55 | 1.40 |
| Nebraska..... | 45 | 2 | 33 | 50 | 82 | 6 | 68 | 2.70 | 2.40 | 2.35 | 1.50 | 1.60 | 2.00 | 1.65 |
| Kansas..... | 78 | 231 | 371 | 266 | 259 | 84 | 385 | 2.52 | 2.00 | 1.85 | 1.70 | 1.75 | 1.90 | 1.55 |
| North Central..... | 4,834 | 3,300 | 3,798 | 9,379 | 4,014 | 5,936 | 7,405 | 1.99 | 1.96 | 2.11 | 1.26 | 2.00 | 1.52 | 1.55 |
| Delaware..... | 225 | 400 | 155 | 450 | 287 | 100 | 378 | 1.50 | 1.40 | 1.55 | .85 | 1.10 | 1.20 | 1.19 |
| Maryland..... | 631 | 600 | 240 | 700 | 352 | 465 | 532 | 1.50 | 1.36 | 1.85 | .75 | 1.50 | 1.30 | 1.20 |
| Virginia..... | 504 | 1,500 | 362 | 1,176 | 400 | 890 | 928 | 2.10 | 1.20 | 1.90 | 1.00 | 1.09 | 1.40 | 1.00 |
| West Virginia..... | 526 | 1,000 | 100 | 1,000 | 202 | 810 | 590 | 2.05 | 1.60 | 2.29 | 1.25 | 2.10 | 1.50 | 1.55 |
| North Carolina..... | 260 | 2,500 | 1,500 | 2,250 | 1,300 | 2,590 | 1,400 | 2.05 | 1.28 | 1.60 | .90 | 1.70 | 1.15 | 1.40 |
| South Carolina..... | 550 | 800 | 740 | 1,054 | 615 | 1,363 | 552 | 2.20 | 1.16 | 1.35 | 1.00 | 1.50 | 1.10 | 1.35 |
| Georgia..... | 5,248 | 8,342 | 7,304 | 9,400 | 5,943 | 10,000 | 2,880 | 1.65 | 1.01 | 1.40 | .80 | 1.35 | .90 | 1.15 |
| Florida..... | 120 | 127 | 115 | 125 | 69 | 112 | 94 | 2.25 | 1.70 | 1.65 | 1.60 | 1.75 | 1.35 | 1.70 |
| South Atlantic..... | 8,094 | 15,269 | 10,516 | 16,155 | 9,168 | 16,320 | 7,344 | 1.75 | 1.15 | 1.46 | .84 | 1.44 | .97 | 1.23 |
| Kentucky..... | 450 | 1,250 | 570 | 1,110 | 180 | 1,635 | 600 | 1.64 | 1.45 | 1.75 | 1.30 | 1.90 | 1.25 | 1.45 |
| Tennessee..... | 460 | 2,450 | 1,415 | 1,800 | 638 | 2,190 | 1,225 | 1.06 | 1.30 | 1.55 | 1.05 | 1.70 | 1.10 | 1.25 |
| Alabama..... | 779 | 1,290 | 1,312 | 1,159 | 540 | 1,350 | 504 | 1.38 | 1.17 | 1.60 | 1.10 | 1.50 | 1.10 | 1.30 |
| Mississippi..... | 260 | 700 | 712 | 531 | 279 | 635 | 444 | 2.09 | 1.79 | 1.55 | 1.40 | 1.65 | 1.45 | 1.50 |
| Arkansas..... | 1,110 | 2,700 | 2,200 | 2,400 | 1,628 | 3,000 | 2,635 | 1.59 | 1.02 | 1.50 | 1.05 | 1.40 | 1.20 | 1.20 |
| Louisiana..... | 175 | 230 | 275 | 228 | 86 | 211 | 154 | 2.00 | 1.80 | 2.00 | 1.50 | 1.80 | 1.60 | 1.70 |
| Oklahoma..... | 1,032 | 1,861 | 950 | 180 | 760 | 480 | 1,100 | 1.44 | 1.02 | 1.33 | 1.30 | 1.30 | 1.30 | 1.00 |
| Texas..... | 1,700 | 1,900 | 1,750 | 2,310 | 800 | 1,612 | 1,953 | 1.84 | 1.48 | 1.50 | 1.10 | 1.60 | 1.30 | 1.25 |
| South Central..... | 5,966 | 12,321 | 9,184 | 9,798 | 4,911 | 10,513 | 8,615 | 1.66 | 1.26 | 1.54 | 1.13 | 1.51 | 1.21 | 1.24 |
| Idaho..... | 282 | 102 | 23 | 297 | 144 | 335 | 288 | 1.08 | 2.00 | 1.90 | 1.00 | 1.60 | 1.05 | 1.35 |
| Colorado..... | 750 | 920 | 450 | 976 | 892 | 650 | 1,000 | 1.71 | 1.60 | 1.90 | 1.10 | 1.20 | 1.20 | 1.45 |
| New Mexico..... | 189 | 62 | 156 | 131 | 40 | 46 | 94 | 2.00 | 1.90 | 1.75 | 1.80 | 2.20 | 1.95 | 1.80 |
| Arizona..... | 70 | 40 | 65 | 91 | 55 | 66 | 60 | 2.50 | 2.00 | 1.70 | 1.70 | 2.30 | 2.00 | 1.80 |
| Utah..... | 802 | 750 | 100 | 550 | 561 | 612 | 742 | 1.29 | 1.50 | 2.00 | .90 | 1.20 | .95 | 1.00 |
| Nevada..... | 5 | 2 | 8 | 8 | 2 | 5 | 5 | 2.00 | 1.75 | 2.25 | 1.50 | 2.30 | 2.00 | 2.25 |
| Washington..... | 1,333 | 460 | 870 | 1,222 | 250 | 1,470 | 1,250 | 1.34 | 2.40 | 1.85 | .90 | 1.75 | 1.00 | 1.35 |
| Oregon..... | 500 | 180 | 222 | 384 | 160 | 292 | 232 | 1.68 | 1.50 | 1.80 | 1.20 | 1.60 | 1.40 | 1.70 |
| California..... | 15,830 | 13,751 | 16,418 | 22,542 | 20,500 | 25,752 | 13,543 | .58 | .84 | .86 | .94 | .60 | .55 | 1.35 |
| Far Western..... | 19,761 | 16,276 | 18,312 | 26,201 | 22,604 | 29,228 | 17,014 | .76 | .98 | .96 | .95 | .68 | .56 | 1.35 |
| United States..... | 45,382 | 53,848 | 46,562 | 69,865 | 35,463 | 68,369 | 45,998 | 1.37 | 1.26 | 1.38 | 1.00 | 1.18 | .99 | 1.36 |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board. Prices are based upon returns from crop reporters.

¹ From 1923-1925, Sept. 15 price in North, Aug. 15 price in South; 1926-1929 approximate average price for the season as reported Dec. 1.

² Preliminary.

³ The production of peaches shown above includes some estimated quantities not harvested or not utilized, as follows: 1926, 1,462,000 bushels in Georgia and Northern States; 1927, 2,708,000 bushels in California; 1928, 2,917,000 bushels in California and 1,000,000 bushels in Georgia. Values are based on the quantity actually harvested.

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TABLE 204.—Peaches: Car-lot shipments by State of origin, 1927-1929

| State and year | Crop movement season ¹ | | | | | | |
|-------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | May | June | July | August | September | October | Total |
| New York: | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| 1927 | | | | 2 | 1,015 | 112 | 1,150 |
| 1928 | | | | 5 | 1,389 | 350 | 1,744 |
| 1929 ² | | | | 2 | 820 | 61 | 883 |
| New Jersey: | | | | | | | |
| 1927 | | | 8 | 366 | 714 | 1 | 1,089 |
| 1928 | | | | 15 | 26 | | 41 |
| 1929 ² | | | 14 | 405 | 52 | | 531 |
| Illinois: | | | | | | | |
| 1927 | | | 55 | 1,532 | 4 | | 1,591 |
| 1928 | | | 24 | 1,912 | 9 | | 1,945 |
| 1929 ² | | 11 | 51 | 4,554 | 7 | | 4,623 |
| Michigan: | | | | | | | |
| 1927 | | | | 6 | 391 | | 397 |
| 1928 | | | | 3 | 474 | 37 | 511 |
| 1929 ² | | | | | 322 | 1 | 323 |
| North Carolina: | | | | | | | |
| 1927 | 16 | 87 | 1,577 | 22 | | | 1,702 |
| 1928 | | 57 | 1,032 | 2,153 | | | 3,242 |
| 1929 ² | 4 | 31 | 1,176 | 17 | | | 1,228 |
| Georgia: | | | | | | | |
| 1927 | 249 | 5,420 | 6,207 | 6 | | | 11,882 |
| 1928 | 3 | 1,492 | 11,086 | 2,445 | | | 15,926 |
| 1929 ² | 95 | 2,088 | 3,102 | 31 | | | 5,316 |
| Tennessee: | | | | | | | |
| 1927 | | | 501 | 2 | | | 503 |
| 1928 | | | 26 | 2,785 | | | 2,811 |
| 1929 ² | | | 776 | 268 | | | 1,044 |
| Arkansas: | | | | | | | |
| 1927 | | | 1,778 | 2 | | | 1,780 |
| 1928 | | 1 | 2,419 | 1,500 | | | 4,010 |
| 1929 ² | | 3 | 2,406 | 265 | | | 2,674 |
| Texas: | | | | | | | |
| 1927 | 2 | | 47 | | | | 49 |
| 1928 | | | 240 | 38 | | | 278 |
| 1929 ² | | 12 | 550 | 9 | | | 571 |
| Colorado: | | | | | | | |
| 1927 | | | | 897 | 809 | 3 | 1,709 |
| 1928 | | | | 498 | 618 | 1 | 1,117 |
| 1929 ² | | | | 42 | 1,701 | 12 | 1,755 |
| Utah: | | | | | | | |
| 1927 | | 1 | 2 | 59 | 736 | | 798 |
| 1928 | | | | 26 | 667 | 1 | 694 |
| 1929 ² | | | | 4 | 544 | | 548 |
| Washington: | | | | | | | |
| 1927 | | | 1 | 27 | 212 | 8 | 248 |
| 1928 | | | 6 | 603 | 1,020 | 22 | 1,741 |
| 1929 ² | | | | 194 | 1,324 | 23 | 1,541 |
| California: | | | | | | | |
| 1927 | | 97 | 1,727 | 8,397 | 4,904 | 20 | 15,145 |
| 1928 | 9 | 114 | 6,669 | 9,640 | 3,157 | | 19,589 |
| 1929 ² | 5 | 133 | 1,360 | 4,941 | 3,222 | 123 | 9,793 |
| Other States: | | | | | | | |
| 1927 | | 33 | 772 | 1,899 | 954 | 4 | 3,662 |
| 1928 | | 91 | 720 | 1,720 | 1,442 | 51 | 4,024 |
| 1929 ² | | 2 | 99 | 828 | 257 | 8 | 4,464 |
| Total: | | | | | | | |
| 1927 | 1,325 | 4,006 | 9,544 | 7,381 | 5,035 | 44 | 27,334 |
| 1928 | 695 | 3,180 | 7,598 | 11,928 | 13,779 | 1,216 | 38,406 |
| 1929 | 1 | 2,381 | 10,963 | 9,757 | 9,654 | 766 | 33,525 |
| 1929 ² | | 1,873 | 14,603 | 13,781 | 7,889 | 3,323 | 39,497 |
| 1929 ³ | | 4,951 | 17,932 | 9,921 | 7,420 | 306 | 40,858 |
| 1929 ⁴ | | 2,209 | 21,798 | 24,538 | 8,947 | 1,026 | 58,465 |
| 1929 ⁵ | | 5,638 | 12,675 | 13,217 | 9,739 | 178 | 41,714 |
| 1929 ⁶ | | 1,755 | 23,122 | 23,553 | 8,802 | 462 | 57,706 |
| 1929 ⁷ | | 2,377 | 10,272 | 14,062 | 8,219 | 228 | 35,264 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. See 1927 Yearbook, page 855, for data for earlier years.

¹ Crop movement season extends from May 1 through October of a given year.

² Preliminary.

³ Includes 1 car in November.

⁴ Includes 5 cars in November.

TABLE 205.—*Peaches: Average l. c. l. price to jobbers, New York and Chicago, 1919-1929*

| Market, and season beginning May | 6-basket carrier | | | Bushel basket | | | | |
|----------------------------------|-------------------|----------------|---------------------|-------------------|----------------|---------------------|------------------------|----------------------|
| | June ¹ | July | August ² | June ¹ | July | August ² | September ² | October ² |
| New York: | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| 1919..... | 2.40 | 2.21 | 2.25 | | | 2.43 | 2.84 | |
| 1920..... | 3.03 | 3.32 | 2.95 | | | | 2.52 | |
| 1921..... | 3.34 | 3.04 | 5.00 | | 2.62 | | | |
| 1922..... | 3.05 | 2.57 | 2.16 | | 2.20 | 1.90 | 1.78 | 1.43 |
| 1923..... | 3.31 | 2.10 | 2.03 | | 2.18 | 2.16 | 2.48 | 1.94 |
| 1924..... | 2.97 | 2.25 | 2.31 | | 1.74 | 2.18 | 2.09 | 2.46 |
| 1925..... | 3.43 | 2.24 | 2.23 | 3.38 | 2.22 | 2.18 | 2.74 | 2.46 |
| 1926..... | 3.14 | 1.79 | 1.28 | 3.05 | 1.74 | 1.48 | 1.26 | 1.17 |
| 1927..... | 3.22 | 2.59 | 2.65 | 3.10 | 2.80 | 2.94 | 2.19 | 2.59 |
| 1928..... | 3.48 | 2.17 | 1.62 | 3.61 | 2.01 | 1.69 | 2.05 | 1.74 |
| 1929..... | 3.86 | 3.45 | 2.70 | 3.85 | 2.95 | 2.56 | 2.52 | |
| Chicago: | | | | | | | | |
| 1919..... | 2.51 | 2.35 | | | 2.99 | 3.17 | 2.65 | |
| 1920..... | 2.77 | 3.00 | 3.26 | 2.79 | 2.68 | 3.08 | 2.58 | |
| 1921..... | 2.47 | 2.95 | 4.23 | 2.74 | 3.20 | | | |
| 1922..... | 2.72 | 2.65 | | 2.76 | 2.51 | 1.91 | 1.70 | 1.38 |
| 1923..... | 2.79 | 2.39 | 2.56 | | 2.76 | 3.06 | 2.11 | 2.25 |
| 1924..... | 1.98 | 1.88 | 2.07 | 1.84 | 1.86 | 2.30 | 2.91 | 2.17 |
| 1925..... | 3.11 | 2.35 | 3.01 | 3.08 | 2.45 | 3.16 | 2.72 | 2.38 |
| 1926..... | 3.02 | 1.96 | 1.53 | 2.44 | 2.02 | 1.79 | 1.76 | 1.44 |
| 1927..... | 2.30 | 2.32 | | 2.35 | 2.66 | 2.81 | 2.30 | |
| 1928..... | 3.40 | 2.09 | 1.44 | | 2.18 | 1.94 | 2.15 | 2.11 |
| 1929..... | 4.08 | 3.45 | | | 2.93 | 2.05 | 2.31 | |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices.

¹ Commodity reports began June 2, 1919, June 7, 1920, 1926, and 1929, June 3, 1921 and 1924, May 25, 1922, June 5, 1923, June 1, 1925, June 11, 1927, June 20, 1928.

² Last reported quotations of season, Sept. 27 1919, Oct. 8, 1920, Aug. 9, 1921, Oct. 11, 1922, Oct. 13, 1923 and 1924, Oct. 3, 1925, Oct. 21, 1926, Oct. 12, 1927, Oct. 15, 1928.

TABLE 206.—*Pears: Total production, foreign trade of the United States, and average price per bushel, 1913-1929*

| Year | Production | Price per bushel received by producers ² | Farm value | Domestic exports, year beginning July 1 ¹ | | |
|-------------------------|----------------------|---|----------------------|--|---------------------|-------------------------|
| | | | | Fresh ³ | Canned ³ | Total in terms of fresh |
| | <i>1,000 bushels</i> | <i>Dollars</i> | <i>1,000 dollars</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 bushels</i> |
| 1913..... | 10,108 | | | | | |
| 1914..... | 12,086 | | | | | |
| 1915..... | 11,216 | | | | | |
| 1916..... | 11,874 | | | | | |
| 1917..... | 13,281 | | | | | |
| 1918..... | 13,362 | 1.38 | 18,419 | | | |
| 1919..... | 14,804 | | | | | |
| 1919..... | 15,006 | 1.84 | 27,614 | | | |
| 1920..... | 16,805 | 1.66 | 27,865 | | | |
| 1921..... | 11,297 | 1.71 | 19,268 | | | |
| 1922..... | 20,705 | 1.06 | 21,943 | 36,785 | 49,358 | 2,823 |
| 1923..... | 17,845 | 1.21 | 21,570 | 50,237 | 38,431 | 2,648 |
| 1924..... | 18,866 | 1.42 | 26,689 | 41,452 | 53,851 | 3,107 |
| 1925..... | 20,720 | 1.40 | 29,066 | 71,205 | 75,876 | 4,645 |
| 1926..... | 25,249 | .89 | 22,399 | 73,877 | 66,104 | 4,293 |
| 1927..... | 18,373 | 1.32 | 24,298 | 51,056 | 52,671 | 3,258 |
| 1928..... | 24,212 | 1.02 | 24,663 | 82,847 | 82,652 | 5,170 |
| 1929 ⁴ | 20,903 | 1.43 | 29,952 | | | |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; Italian figures are census returns. Prices are based upon returns from crop reporters.

¹ Canned pears converted to terms of fresh on the basis that 1 pound canned fruit is equivalent to 2 pounds fresh; 48 pounds fresh equals 1 bushel. No imports of pears reported.

² From 1918 to 1925, Nov. 15 price; 1926 to 1929, approximate average price for the season, as reported Dec. 1.

³ Exports were reported in value only, prior to July 1, 1922.

⁴ Preliminary.

TABLE 207.—*Pears: Production and seasonal farm price, by States, 1923-1929*

| State and division | Production | | | | | | | Seasonal farm price per bushel ¹ | | | | | | | |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|---|-------|-------|-------|-------|-------|-------|--|
| | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ² | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | |
| | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | Dols. | Dols. | Dols. | Dols. | Dols. | Dols. | Dols. | |
| Maine..... | 7 | 12 | 13 | 6 | 13 | 10 | 13 | 2.00 | 1.50 | 1.90 | 1.50 | 1.70 | 1.50 | 1.85 | |
| New Hampshire..... | 12 | 17 | 19 | 10 | 14 | 9 | 15 | 2.00 | 1.50 | 1.58 | 1.65 | 1.70 | 1.70 | 1.60 | |
| Vermont..... | 6 | 12 | 12 | 6 | 12 | 6 | 12 | 2.25 | 1.50 | 1.62 | 2.00 | 2.15 | 2.10 | 1.90 | |
| Massachusetts..... | 58 | 84 | 90 | 60 | 81 | 56 | 74 | 2.20 | 1.70 | 1.65 | 1.80 | 1.75 | 1.70 | 1.80 | |
| Rhode Island..... | 10 | 12 | 13 | 12 | 12 | 7 | 11 | 2.50 | 1.70 | 1.75 | 1.60 | 1.80 | 1.80 | 2.00 | |
| Connecticut..... | 37 | 62 | 60 | 57 | 54 | 42 | 52 | 2.25 | 1.65 | 2.00 | 1.90 | 2.00 | 1.60 | 2.00 | |
| New York..... | 1,000 | 2,100 | 3,045 | 2,088 | 1,872 | 1,800 | 1,152 | 1.88 | 1.45 | 1.55 | 1.25 | 1.50 | 1.45 | 1.85 | |
| New Jersey..... | 662 | 624 | 512 | 645 | 420 | 502 | 338 | 1.00 | 1.05 | 1.70 | .65 | 1.00 | 1.00 | 1.60 | |
| Pennsylvania..... | 612 | 629 | 468 | 748 | 400 | 620 | 272 | 1.21 | 1.29 | 1.55 | 1.15 | 1.50 | 1.20 | 1.55 | |
| North Atlantic..... | 2,404 | 3,552 | 4,232 | 3,632 | 2,878 | 3,052 | 1,939 | 1.48 | 1.36 | 1.58 | 1.15 | 1.45 | 1.34 | 1.77 | |
| Ohio..... | 332 | 326 | 354 | 430 | 250 | 395 | 175 | 1.06 | 1.20 | 1.25 | .85 | 1.25 | .90 | 1.40 | |
| Indiana..... | 334 | 180 | 209 | 328 | 140 | 288 | --- | .75 | .92 | 1.00 | .65 | 1.05 | .75 | --- | |
| Illinois..... | 307 | 500 | 540 | 818 | 312 | 540 | 209 | .94 | 1.01 | 1.20 | .75 | 1.10 | .85 | .85 | |
| Michigan..... | 1,005 | 810 | 450 | 889 | 702 | 819 | 711 | 1.07 | 1.10 | 1.15 | .80 | 1.25 | .95 | .90 | |
| Wisconsin..... | 16 | 15 | 15 | --- | --- | --- | 468 | 1.31 | 1.50 | 1.50 | --- | --- | --- | 1.35 | |
| Iowa..... | 62 | 40 | 45 | 68 | 41 | 47 | 72 | 1.11 | 1.80 | 1.70 | 1.20 | 1.50 | 1.20 | 1.35 | |
| Missouri..... | 475 | 375 | 342 | 473 | 270 | 171 | 445 | .95 | 1.06 | 1.20 | .80 | 1.15 | 1.15 | .95 | |
| Nebraska..... | 24 | 30 | 18 | 29 | 36 | 12 | 40 | 2.06 | 2.20 | 2.00 | 1.60 | 1.60 | 1.90 | 1.50 | |
| Kansas..... | 134 | 262 | 165 | 186 | 258 | 51 | 234 | 1.61 | 1.15 | 1.50 | 1.25 | 1.10 | 1.40 | 1.10 | |
| North Central..... | 2,689 | 2,538 | 2,138 | 3,221 | 2,000 | 2,323 | 2,334 | 1.03 | 1.11 | 1.22 | .82 | 1.19 | .93 | 1.07 | |
| Delaware..... | 370 | 328 | 180 | 388 | 128 | 108 | 248 | .50 | .90 | 1.00 | .40 | .60 | .60 | .50 | |
| Maryland..... | 374 | 335 | 280 | 394 | 183 | 193 | 254 | 1.00 | .82 | 1.00 | .55 | .90 | .90 | .80 | |
| Virginia..... | 200 | 430 | 135 | 410 | 130 | 230 | 330 | 1.36 | .76 | 1.30 | .80 | 1.15 | 1.05 | .90 | |
| West Virginia..... | 41 | 84 | 34 | 100 | 12 | 63 | 49 | 1.30 | 1.39 | 1.70 | 1.15 | 1.05 | 1.25 | 1.40 | |
| North Carolina..... | 65 | 273 | 158 | 270 | 100 | 234 | 205 | 1.71 | 1.41 | 1.70 | 1.15 | 1.35 | 1.10 | 1.20 | |
| South Carolina..... | 88 | 114 | 87 | 133 | 68 | 133 | 104 | 1.30 | 1.42 | 1.50 | 1.20 | 1.30 | 1.10 | 1.25 | |
| Georgia..... | 192 | 232 | 155 | 257 | 104 | 245 | 174 | 1.16 | 1.27 | 1.50 | 1.05 | 1.35 | 1.00 | 1.05 | |
| Florida..... | 35 | 55 | 54 | 66 | 44 | 52 | 51 | 1.25 | 1.50 | 1.25 | 1.25 | 1.15 | .95 | 1.05 | |
| South Atlantic..... | 1,365 | 1,851 | 1,083 | 2,018 | 779 | 1,258 | 1,415 | 1.01 | 1.05 | 1.29 | .81 | 1.07 | 1.00 | .92 | |
| Kentucky..... | 70 | 117 | 85 | 144 | 34 | 116 | 129 | 1.32 | 1.42 | 1.35 | .95 | 1.45 | 1.10 | 1.00 | |
| Tennessee..... | 83 | 250 | 148 | 266 | 125 | 255 | 242 | 1.62 | 1.23 | 1.50 | 1.05 | 1.45 | 1.05 | 1.05 | |
| Alabama..... | 174 | 224 | 157 | 211 | 83 | 234 | 142 | 1.52 | 1.28 | 1.40 | .90 | 1.30 | 1.10 | 1.15 | |
| Mississippi..... | 90 | 187 | 189 | 189 | 120 | 194 | 132 | 1.50 | 1.50 | 1.30 | 1.15 | 1.10 | 1.10 | 1.05 | |
| Arkansas..... | 45 | 124 | 89 | 116 | 70 | 102 | 104 | 2.00 | 1.25 | 1.45 | 1.15 | 1.30 | 1.20 | 1.20 | |
| Louisiana..... | 45 | 65 | 74 | 71 | 50 | 69 | 59 | 1.70 | 1.90 | 1.45 | 1.30 | 1.40 | 1.35 | 1.35 | |
| Oklahoma..... | 100 | 235 | 146 | 81 | 130 | 72 | 190 | 1.75 | 1.19 | 1.60 | 1.40 | 1.30 | 1.30 | 1.05 | |
| Texas..... | 340 | 483 | 386 | 580 | 345 | 300 | 455 | 1.57 | 1.21 | 1.35 | .90 | 1.25 | 1.25 | 1.00 | |
| South Central..... | 947 | 1,685 | 1,274 | 1,658 | 957 | 1,432 | 1,453 | 1.58 | 1.30 | 1.41 | 1.02 | 1.29 | 1.16 | 1.06 | |
| Montana..... | 8 | --- | --- | --- | --- | --- | 53 | 2.00 | --- | --- | --- | --- | --- | 1.70 | |
| Idaho..... | 72 | 60 | 39 | 68 | 56 | 72 | 650 | 1.76 | 1.65 | 2.10 | 1.50 | 1.60 | 1.35 | 1.50 | |
| Colorado..... | 400 | 550 | 510 | 564 | 480 | 185 | 63 | 1.56 | 1.40 | 1.15 | .65 | 1.40 | 1.05 | 1.40 | |
| New Mexico..... | 49 | 28 | 56 | 42 | 28 | 27 | --- | 2.40 | 1.75 | 1.70 | 1.50 | 1.70 | 1.55 | --- | |
| Arizona..... | 18 | 11 | 14 | 15 | 12 | 15 | 16 | 2.40 | 2.00 | 2.20 | 2.50 | 2.50 | 2.50 | 2.45 | |
| Utah..... | 64 | 70 | 25 | 80 | 60 | 87 | 70 | 1.32 | 1.88 | 1.75 | 1.10 | 1.70 | 1.40 | 1.50 | |
| Nevada..... | 7 | 4 | 7 | 6 | 2 | 6 | 3 | 1.90 | 2.00 | 2.00 | 2.00 | 2.50 | 2.50 | 2.55 | |
| Washington..... | 2,700 | 1,750 | 2,300 | 3,220 | 1,670 | 3,700 | 2,800 | 1.10 | 1.65 | 1.70 | .80 | 1.35 | 1.05 | 1.35 | |
| Oregon..... | 1,580 | 1,225 | 1,500 | 2,100 | 1,900 | 2,700 | 2,356 | 1.08 | 1.70 | 1.60 | .85 | 1.40 | 1.00 | 1.40 | |
| California..... | 5,542 | 5,542 | 7,542 | 8,625 | 7,542 | 9,355 | 7,751 | 1.20 | 1.60 | 1.25 | .84 | 1.30 | .90 | 1.65 | |
| Far Western..... | 10,440 | 9,240 | 11,993 | 14,720 | 11,750 | 16,147 | 13,762 | 1.18 | 1.61 | 1.38 | .83 | 1.33 | .96 | 1.54 | |
| United States..... | 17,845 | 18,866 | 20,720 | 25,249 | 18,373 | 24,212 | 20,903 | 1.21 | 1.42 | 1.40 | .89 | 1.32 | 1.02 | 1.43 | |

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board. Prices are based upon returns from crop reporters.

¹ From 1923-1925, Nov. 15 price; 1926-1929, approximate average price for the season as reported Dec. 1.

² Preliminary.

TABLE 208.—*Pears: Car-lot shipments, by State of origin, 1920-1923*

| State | Crop-movement season ¹ | | | | | | | | |
|-------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 ² |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 3,979 | 2,893 | 5,461 | 1,701 | 2,978 | 4,510 | 2,263 | 1,694 | 1,590 |
| New Jersey..... | 74 | 23 | 40 | 76 | 60 | 52 | 47 | 19 | 16 |
| Ohio..... | 64 | 17 | 96 | 33 | 47 | 62 | 100 | 130 | 104 |
| Indiana..... | 71 | ----- | 44 | 39 | 61 | 59 | 44 | 39 | 31 |
| Illinois..... | 1,179 | 33 | 468 | 318 | 595 | 614 | 858 | 228 | 370 |
| Michigan..... | 1,204 | 653 | 1,860 | 543 | 394 | 151 | 457 | 536 | 449 |
| Delaware..... | 200 | ----- | 151 | 541 | 273 | 128 | 249 | 49 | 1 |
| Maryland..... | 54 | 3 | 36 | 63 | 30 | 29 | 33 | 32 | 27 |
| Texas..... | 98 | 115 | 50 | 99 | 129 | 121 | 144 | 213 | 39 |
| Colorado..... | 654 | 745 | 774 | 606 | 955 | 717 | 750 | 737 | 264 |
| Utah..... | 88 | 33 | 82 | 65 | 81 | 20 | 77 | 34 | 49 |
| Washington..... | 1,902 | 2,903 | 2,678 | 4,274 | 2,456 | 3,560 | 5,278 | 2,589 | 5,868 |
| Oregon..... | 1,006 | 985 | 1,862 | 2,575 | 1,483 | 2,225 | 2,909 | 2,977 | 4,437 |
| California..... | 5,016 | 4,500 | 6,465 | 7,143 | 6,312 | 8,718 | 11,673 | 9,215 | 11,003 |
| Other States..... | 202 | 150 | 314 | 423 | 392 | 282 | 327 | 252 | 186 |
| Total..... | 15,941 | 13,053 | 20,381 | 18,589 | 16,246 | 21,257 | 25,209 | 18,744 | 24,434 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop movement season extends from June 1 of one year through May of the following year.

² Preliminary.

TABLE 209.—*Pears: Estimated price per bushel received by producers, United States, 1910-1929*

| Year | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Weight- ed aver- age | Year | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Weight- ed aver- age |
|-----------|--------------|--------------|--------------|--------------|--------------|----------------------------|-----------|--------------|--------------|--------------|--------------|--------------|----------------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1910..... | ----- | 100.9 | 98.6 | 100.8 | 122.4 | 100.9 | 1920..... | 195.5 | 197.9 | 184.2 | 170.1 | 164.5 | 194.1 |
| 1911..... | 118.0 | 103.8 | 97.2 | 85.1 | 111.0 | 109.4 | 1921..... | 165.2 | 175.1 | 186.4 | 194.9 | 198.7 | 172.2 |
| 1912..... | 106.3 | 100.0 | 83.1 | 79.3 | 92.8 | 100.4 | 1922..... | 147.1 | ----- | 116.2 | 119.8 | 118.7 | 139.7 |
| 1913..... | 109.9 | 119.3 | 95.6 | 93.0 | 97.9 | 111.2 | 1923..... | 168.3 | 172.5 | 165.1 | 150.2 | 133.0 | 165.5 |
| 1914..... | 98.8 | 92.8 | 80.4 | 77.5 | 82.5 | 93.7 | 1924..... | 175.2 | 157.8 | 155.0 | 141.0 | ----- | 165.4 |
| 1915..... | 80.8 | 83.8 | 82.7 | 89.8 | 89.7 | 82.5 | 1925..... | 172.6 | 165.2 | 164.2 | 149.7 | 162.6 | 168.2 |
| 1916..... | 109.0 | 102.7 | 96.9 | 93.3 | 105.6 | 104.8 | 1926..... | 137.5 | 119.2 | 117.2 | 105.6 | 97.1 | 127.0 |
| 1917..... | 132.2 | 125.0 | 118.2 | 116.1 | ----- | 127.4 | 1927..... | 141.3 | 140.5 | 150.9 | 156.6 | 163.1 | 142.7 |
| 1918..... | 168.4 | 157.8 | 147.5 | 140.1 | 156.6 | 161.1 | 1928..... | 128.6 | 124.6 | 134.0 | 125.2 | 146.7 | 126.4 |
| 1919..... | 188.4 | 183.0 | 181.3 | 182.0 | 219.5 | 185.7 | 1929..... | 170.3 | 166.7 | 160.0 | 146.0 | 159.2 | 167.0 |

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices weighted by production of pears for each State; yearly price obtained by weighing monthly prices by car-lot shipments.

STATISTICS OF FRUITS AND VEGETABLES

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TABLE 210.—*Strawberries, commercial crop; Acreage, production, and price per quart, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per quart | | | |
|--------------------------|----------------|----------------|----------------|----------------|---------------------|---------------------|---------------------|---------------------|-------------------------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| Early: | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 quarts</i> | <i>1,000 quarts</i> | <i>1,000 quarts</i> | <i>1,000 quarts</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| Alabama..... | 3,620 | 4,520 | 5,380 | 5,430 | 5,140 | 7,924 | 11,836 | 12,326 | 0.18 | 0.15 | 0.16 | .10 |
| Florida..... | 2,980 | 3,680 | 3,670 | 5,640 | 5,513 | 6,900 | 5,138 | 12,408 | .35 | .29 | .35 | .22 |
| Louisiana..... | 18,500 | 21,100 | 23,200 | 24,360 | 24,975 | 16,711 | 33,083 | 34,104 | .29 | .23 | .23 | .21 |
| Mississippi..... | 920 | 600 | 1,000 | 1,040 | 1,104 | 960 | 1,500 | 1,685 | .27 | .20 | .18 | .14 |
| Texas..... | 720 | 1,200 | 1,600 | 2,720 | 1,056 | 2,520 | 2,448 | 3,917 | .29 | .22 | .20 | .12 |
| Total..... | 26,740 | 31,100 | 34,850 | 39,190 | 37,788 | 35,015 | 54,005 | 64,440 | .28 | .22 | .22 | .18 |
| Second early: | | | | | | | | | | | | |
| Arkansas..... | 14,140 | 17,000 | 21,600 | 20,100 | 22,058 | 19,958 | 21,773 | 24,723 | .19 | .11 | .10 | .11 |
| California (S. dist.)... | 820 | 1,620 | 1,600 | 1,280 | 3,317 | 8,664 | 8,320 | 6,400 | .18 | .21 | .17 | .18 |
| Georgia..... | | 170 | 170 | 170 | | 245 | 265 | 250 | | .13 | .12 | .12 |
| North Carolina..... | 5,080 | 5,800 | 6,200 | 5,500 | 10,907 | 16,658 | 16,659 | 14,025 | .16 | .16 | .12 | .13 |
| South Carolina..... | 300 | 300 | 300 | 270 | 600 | 528 | 720 | 594 | .16 | .15 | .12 | .14 |
| Tennessee..... | 13,730 | 17,240 | 18,080 | 16,810 | 17,162 | 28,136 | 24,372 | 25,887 | .18 | .11 | .10 | .08 |
| Virginia..... | 8,000 | 9,420 | 9,980 | 8,980 | 19,360 | 22,796 | 23,453 | 16,433 | .15 | .14 | .13 | .10 |
| Total..... | 42,070 | 51,550 | 57,930 | 53,110 | 73,404 | 96,985 | 95,562 | 88,312 | .17 | .14 | .12 | .11 |
| Intermediate: | | | | | | | | | | | | |
| California (other)..... | 2,090 | 2,130 | 2,150 | 2,280 | 8,747 | 9,419 | 8,025 | 7,820 | .20 | .22 | .15 | .16 |
| Delaware..... | 3,200 | 4,000 | 4,930 | 4,830 | 6,656 | 9,600 | 12,719 | 11,302 | .13 | .11 | .08 | .11 |
| Illinois..... | 3,060 | 4,280 | 4,700 | 4,790 | 3,461 | 3,595 | 6,228 | 6,802 | .12 | .12 | .12 | .09 |
| Kansas..... | 960 | 960 | 960 | 960 | 1,435 | 2,304 | 461 | 1,536 | .17 | .15 | .11 | .10 |
| Kentucky..... | 4,350 | 3,420 | 8,720 | 6,240 | 6,612 | 9,767 | 12,426 | 10,608 | .15 | .16 | .10 | .11 |
| Maryland..... | 10,650 | 12,780 | 13,800 | 11,750 | 34,080 | 28,666 | 22,080 | 21,738 | .15 | .12 | .07 | .11 |
| Missouri..... | 15,170 | 27,000 | 26,490 | 21,990 | 22,027 | 25,758 | 28,212 | 28,587 | .12 | .15 | .11 | .11 |
| New Jersey..... | 5,500 | 6,600 | 7,000 | 6,300 | 10,560 | 14,784 | 15,232 | 11,894 | .15 | .12 | .10 | .10 |
| Oklahoma..... | | | 1,550 | 1,900 | | | 1,240 | 1,824 | | | .08 | .10 |
| Total..... | 44,980 | 66,170 | 70,300 | 61,040 | 93,578 | 103,893 | 107,532 | 102,111 | .15 | .14 | .10 | .11 |
| Late: | | | | | | | | | | | | |
| Indiana..... | 1,650 | 1,650 | 1,680 | 1,510 | 3,135 | 2,053 | 3,276 | 2,869 | .13 | .14 | .10 | .13 |
| Iowa..... | 2,850 | 2,560 | 2,560 | 2,690 | 3,819 | 4,915 | 3,072 | 4,170 | .12 | .18 | .15 | .18 |
| Michigan..... | 6,230 | 6,480 | 6,090 | 6,940 | 9,569 | 12,843 | 9,013 | 8,606 | .13 | .15 | .15 | .18 |
| New York..... | 4,570 | 4,570 | 4,480 | 4,300 | 11,361 | 13,308 | 7,840 | 9,073 | .19 | .18 | .17 | .17 |
| Ohio..... | 3,600 | 3,780 | 3,700 | 4,370 | 9,000 | 5,795 | 5,920 | 7,342 | .16 | .16 | .18 | .13 |
| Oregon..... | 7,320 | 8,400 | 10,000 | 10,500 | 12,766 | 14,280 | 17,000 | 14,700 | .15 | .14 | .13 | .15 |
| Pennsylvania..... | 3,100 | 3,260 | 3,190 | 2,870 | 4,650 | 6,650 | 8,358 | 6,199 | .18 | .15 | .14 | .14 |
| Utah..... | 1,000 | 1,300 | 1,400 | 1,300 | 2,400 | 2,544 | 2,800 | 2,080 | .16 | .12 | .12 | .12 |
| Washington..... | 6,090 | 7,670 | 7,900 | 7,900 | 11,327 | 17,411 | 16,866 | 15,405 | .16 | .12 | .17 | .18 |
| Wisconsin..... | 1,840 | 2,760 | 2,840 | 2,840 | 3,588 | 5,299 | 3,096 | 6,134 | .18 | .15 | .21 | .15 |
| Total..... | 38,250 | 42,430 | 43,840 | 45,220 | 71,615 | 85,098 | 77,241 | 76,578 | .16 | .15 | .15 | .16 |
| Grand total..... | 152,040 | 191,250 | 206,920 | 198,560 | 276,385 | 320,991 | 334,331 | 331,441 | .17 | .15 | .14 | .14 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 211.—*Strawberries: Car-lot shipments, by State of origin, 1920-1929*

| State | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ¹ |
|------------------------------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------|
| Early: | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| Alabama..... | 139 | 285 | 460 | 693 | 408 | 421 | 440 | 901 | 1,021 | 1,354 |
| Florida ² | 182 | 150 | 322 | 1,035 | 580 | 678 | 341 | 618 | 545 | 1,632 |
| Louisiana..... | 626 | 1,525 | 1,576 | 1,678 | 1,865 | 1,070 | 2,342 | 1,659 | 2,850 | 2,859 |
| Mississippi..... | 16 | 38 | 89 | 141 | 108 | 54 | 65 | 88 | 88 | 113 |
| Texas..... | 2 | 2 | 9 | 59 | 76 | 21 | 45 | 126 | 148 | 253 |
| Second early: | | | | | | | | | | |
| Arkansas..... | 650 | 1,087 | 2,165 | 1,342 | 1,013 | 993 | 1,375 | 2,049 | 2,046 | 2,463 |
| California, southern district..... | | | 20 | | 7 | 5 | | 35 | 18 | 10 |
| North Carolina..... | 363 | 503 | 1,101 | 1,668 | 2,046 | 1,634 | 1,253 | 2,202 | 2,151 | 1,870 |
| South Carolina..... | | | 8 | 60 | 22 | 22 | 33 | 33 | 71 | 30 |
| Tennessee..... | 1,150 | 1,839 | 3,634 | 3,279 | 2,902 | 1,637 | 1,253 | 2,425 | 2,180 | 2,461 |
| Virginia..... | 270 | 679 | 1,691 | 1,193 | 1,919 | 1,249 | 1,136 | 1,104 | 984 | 908 |
| Other States..... | | | 3 | 27 | 26 | 20 | 7 | 20 | 23 | 18 |
| Intermediate: | | | | | | | | | | |
| California, other..... | 258 | 292 | 181 | 226 | 184 | 125 | 104 | 147 | 141 | 163 |
| Delaware..... | 652 | 866 | 940 | 924 | 1,307 | 472 | 671 | 915 | 621 | 418 |
| Illinois..... | 112 | 73 | 260 | 224 | 367 | 295 | 247 | 176 | 324 | 275 |
| Indiana..... | 65 | 25 | 51 | 26 | 24 | 29 | 52 | 44 | 126 | 105 |
| Iowa..... | 43 | 20 | 73 | 82 | 113 | 37 | 49 | 41 | 19 | 52 |
| Kansas..... | | | 8 | 19 | 40 | 20 | 1 | 57 | 2 | 63 |
| Kentucky..... | 265 | 395 | 772 | 827 | 467 | 312 | 581 | 976 | 1,078 | 851 |
| Maryland..... | 793 | 1,132 | 1,634 | 1,916 | 2,155 | 1,092 | 1,394 | 1,515 | 960 | 772 |
| Missouri..... | 245 | 451 | 1,963 | 872 | 990 | 1,497 | 1,435 | 1,986 | 2,637 | 2,074 |
| New Jersey..... | 363 | 363 | 274 | 187 | 402 | 126 | 207 | 134 | 186 | 176 |
| Other States..... | | | 14 | 3 | | 2 | | 33 | 46 | 111 |
| Late: | | | | | | | | | | |
| Michigan..... | 446 | 454 | 640 | 408 | 554 | 39 | 155 | 114 | 61 | 45 |
| New York..... | 257 | 243 | 325 | 301 | 345 | 200 | 238 | 189 | 70 | 62 |
| Ohio..... | 6 | 19 | 25 | 8 | 11 | | | 2 | | 3 |
| Oregon..... | 103 | 116 | 141 | 115 | 39 | 57 | 39 | 110 | 99 | 103 |
| Pennsylvania..... | 18 | 5 | 9 | 9 | 27 | | 9 | 5 | | 2 |
| Utah..... | | 3 | 13 | 23 | | | | | 1 | |
| Washington..... | 22 | 140 | 188 | 177 | 39 | 42 | 17 | 93 | 106 | 59 |
| Wisconsin..... | 80 | 52 | 84 | 151 | 183 | 27 | 40 | 31 | 39 | 26 |
| Other States..... | 74 | 108 | 88 | 128 | 99 | 52 | 111 | 88 | 54 | 47 |
| Total..... | 7,199 | 10,865 | 18,761 | 17,801 | 18,966 | 12,256 | 13,617 | 17,893 | 18,715 | 19,378 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Preliminary.

² Figures for Florida include shipments in December of preceding year as follows: 1921, 8 cars; 1924, 3 cars; 1925, 10 cars; 1927, 2 cars; 1929, 1 car.

³ Not reported by separate divisions.

TABLE 212.—*Strawberries: Average l. c. l. price per quart to jobbers, New York and Chicago, 1919-1929*

| Market, and season beginning March | New York | | | | Chicago | | | |
|------------------------------------|--------------------|--------------|--------------|-------------------|--------------------|--------------|--------------|-------------------|
| | March ¹ | April | May | June ² | March ¹ | April | May | June ² |
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1919..... | | 38 | 29 | 24 | | 33 | 25 | 24 |
| 1920..... | | 43 | 35 | 31 | | 34 | 32 | 27 |
| 1921..... | 47 | 41 | 27 | 20 | 31 | 37 | 24 | 14 |
| 1922..... | 60 | 37 | 21 | 16 | 45 | 29 | 14 | 12 |
| 1923..... | 65 | 43 | 20 | 18 | 45 | 41 | 20 | 15 |
| 1924..... | | 41 | 20 | 13 | | 46 | 22 | 17 |
| 1925..... | 42 | 37 | 21 | 23 | 50 | 43 | 21 | 25 |
| 1926..... | | 51 | 26 | 21 | | 42 | 27 | 17 |
| 1927..... | 40 | 37 | 18 | 17 | 37 | 32 | 16 | 19 |
| 1928..... | 50 | 36 | 20 | 10 | 51 | 35 | 27 | 12 |
| 1929..... | 38 | 28 | 13 | | 46 | 26 | 16 | |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units or vice versa in order to obtain comparability.

¹ Commodity reports began Apr. 7, 1919; Apr. 12, 1920; Mar. 17, 1921; Mar. 23, 1922; Mar. 28, 1923; Mar. 31, 1924; Mar. 19, 1925; Mar. 29, 1926; Mar. 7, 1927; Feb. 27, 1928; Apr. 1, 1929. (Quotations from March, 1929, taken from miscellaneous reports.)

² Last reported quotations for season June 20, 1919; June 10, 1920; June 3, 1921; June 6, 1922; June 13, 1923; June 17, 1924; June 9, 1925; June 19, 1926; June 20, 1927; June 12, 1928; June 7, 1929.

TABLE 213.—*Miscellaneous fruits and nuts:*¹ *Production and value, 1927, 1928, and 1929*

| Crop | 1927 | | | 1928 | | | 1929 | | |
|--------------------------------------|--------------------|----------------|----------------------|--------------------|---------------------------|----------------------|--------------------|---------------------------|----------------------|
| | Production | Seasonal price | Value | Production | Price Dec. 1 ² | Value | Production | Price Dec. 1 ² | Value |
| Prunes, marketed fresh: | <i>Tons</i> | <i>Dollars</i> | <i>1,000 dollars</i> | <i>Tons</i> | <i>Dollars</i> | <i>1,000 dollars</i> | <i>Tons</i> | <i>Dollars</i> | <i>1,000 dollars</i> |
| Idaho..... | 22,000 | — | — | 21,748 | 30.00 | 652 | 25,360 | 22.00 | 558 |
| Oregon..... | 17,600 | 20.00 | 352 | 21,600 | 25.00 | 540 | 28,000 | 20.00 | 560 |
| Washington..... | 8,283 | 25.00 | 207 | 18,500 | 28.00 | 518 | 20,000 | 22.50 | 450 |
| Prunes, dried: | | | | | | | | | |
| California..... | 225,000 | 70.00 | 15,750 | 220,300 | 100.00 | 22,030 | 103,000 | 192.00 | 19,776 |
| Oregon..... | 16,000 | 90.00 | 1,440 | 5,000 | 160.00 | 800 | 29,000 | 160.00 | 4,640 |
| Washington..... | 3,500 | 95.00 | 332 | 900 | 160.00 | 144 | 6,500 | 140.00 | 910 |
| Walnuts, English: | | | | | | | | | |
| California..... | 51,000 | 330.00 | 16,830 | 25,000 | 420.00 | 10,500 | 39,000 | 320.00 | 12,480 |
| Oregon..... | 800 | 360.00 | 288 | 1,500 | 440.00 | 660 | 1,050 | 400.00 | 420 |
| Figs, commercial: | | | | | | | | | |
| Dried, California ³ | 12,000 | 45.00 | 540 | 11,500 | 45.00 | 518 | 15,000 | 90.00 | 1,350 |
| Not dried, California..... | 5,400 | 100.00 | 540 | 6,130 | 87.00 | 533 | 6,000 | 100.00 | 600 |
| Not dried, Texas..... | 4,879 | 80.00 | 390 | 6,338 | 65.50 | 415 | — | — | — |
| | <i>1,000 boxes</i> | | | <i>1,000 boxes</i> | | | <i>1,000 boxes</i> | | |
| Limes: Florida..... | 0 | — | — | 6 | 4.50 | 27 | 7 | 5.50 | 38 |
| Pineapples: Florida..... | 13 | 1.90 | 25 | 9 | 1.70 | 15 | 6 | 2.50 | 15 |

Bureau of Agricultural Economics.

¹ Incomplete. Estimates for some States are not available. See also Table 214.² For products marketed prior to Dec. 1 the prices shown represent approximate averages for the season.³ Estimates for dried figs include some not of merchantable quality.TABLE 214.—*Fruits and nuts: Production and value in California, 1919-1929*

| Crop and year | Production | Farm value, Dec. 1 | | Crop and year | Production | Farm value, Dec. 1 | |
|------------------------|-------------|--------------------|----------------------|-----------------------|-------------|--------------------|----------------------|
| | | Per unit | Total | | | Per unit | Total |
| Apricots: ¹ | <i>Tons</i> | <i>Dollars</i> | <i>1,000 dollars</i> | Plums—Contd. | <i>Tons</i> | <i>Dollars</i> | <i>1,000 dollars</i> |
| 1919..... | 175,000 | 80.00 | 14,000 | 1928..... | 66,000 | 37.00 | 2,442 |
| 1920..... | 110,000 | 85.00 | 9,350 | 1929..... | 39,000 | 90.00 | 3,510 |
| 1921..... | 100,000 | 50.00 | 5,000 | Cherries: | | | |
| 1922..... | 145,000 | 70.00 | 10,150 | 1919..... | 12,400 | 150.00 | 1,860 |
| 1923..... | 210,000 | 25.00 | 5,250 | 1920..... | 17,500 | 200.00 | 3,500 |
| 1924..... | 142,000 | 46.00 | 6,532 | 1921..... | 13,000 | 125.00 | 1,625 |
| 1925..... | 150,000 | 54.00 | 8,100 | 1922..... | 14,000 | 180.00 | 2,520 |
| 1926..... | 176,000 | 63.00 | 11,088 | 1923..... | 17,000 | 160.00 | 2,720 |
| 1927..... | 208,000 | 57.00 | 11,856 | 1924..... | 13,500 | 140.00 | 1,890 |
| 1928..... | 175,000 | 50.00 | 8,750 | 1925..... | 12,000 | 160.00 | 1,920 |
| 1929..... | 195,000 | 63.00 | 12,285 | 1926..... | 20,000 | 180.00 | 3,600 |
| Prunes: ² | | | | 1927..... | 12,000 | 180.00 | 2,160 |
| 1919..... | 135,000 | 240.00 | 32,400 | 1928..... | 18,500 | 150.00 | 2,775 |
| 1920..... | 97,250 | 130.00 | 12,643 | 1929..... | 16,000 | 190.00 | 3,040 |
| 1921..... | 100,000 | 130.00 | 13,000 | Grapes (all): | | | |
| 1922..... | 110,000 | 140.00 | 15,400 | 1923..... | 2,030,000 | 26.00 | 52,780 |
| 1923..... | 130,000 | 100.00 | 13,000 | 1924..... | 1,535,000 | 35.00 | 53,725 |
| 1924..... | 139,000 | 110.00 | 15,290 | 1925..... | 2,050,000 | 28.00 | 57,536 |
| 1925..... | 146,000 | 110.00 | 16,060 | 1926..... | 2,129,000 | 25.00 | 53,225 |
| 1926..... | 150,000 | 100.00 | 15,000 | 1927..... | 2,406,000 | 24.00 | 57,744 |
| 1927..... | 225,000 | 70.00 | 15,750 | 1928..... | 2,360,000 | 16.00 | 37,760 |
| 1928..... | 220,300 | 100.00 | 22,030 | 1929..... | 1,751,000 | 26.52 | 46,445 |
| 1929..... | 103,000 | 192.00 | 19,776 | Raisins: ³ | | | |
| Plums: ^{1,2} | | | | 1919..... | 182,500 | 210.00 | 38,325 |
| 1919..... | 42,000 | 60.00 | 2,520 | 1920..... | 177,000 | 235.00 | 41,595 |
| 1920..... | 35,000 | 90.00 | 3,150 | 1921..... | 145,000 | 190.00 | 27,550 |
| 1921..... | 42,000 | 53.00 | 2,226 | 1922..... | 237,000 | 105.00 | 24,885 |
| 1922..... | 48,000 | 50.00 | 2,400 | 1923..... | 290,000 | 45.00 | 13,050 |
| 1923..... | 69,000 | 30.00 | 2,070 | 1924..... | 170,000 | 70.00 | 11,900 |
| 1924..... | 39,000 | 45.00 | 1,755 | 1925..... | 200,000 | 80.00 | 16,000 |
| 1925..... | 51,000 | 40.00 | 2,040 | 1926..... | 272,000 | 70.00 | 19,040 |
| 1926..... | 71,000 | 25.00 | 1,775 | 1927..... | 285,000 | 60.00 | 17,100 |
| 1927..... | 57,000 | 45.00 | 2,565 | 1928..... | 261,000 | 40.00 | 10,440 |
| | | | | 1929..... | 195,000 | 70.00 | 13,650 |

¹ To calculate the production of apricots and plums in bushels, multiply the production in tons by 2,000 (the number of pounds in a ton) and divide by 48, the usual number of pounds in a bushel.² Dried basis. To calculate in terms of fresh fruit multiply the quantity of dried prunes produced by 2½.³ The production shown includes a small quantity of prune varieties shipped fresh, but does not include prunes dried.⁴ The totals shown for California include 138,000 tons not harvested in 1925; 15,000 tons not harvested in 1926; 142,000 tons not harvested in 1927; and 153,000 tons not harvested in 1928. The grapes not harvested were of table varieties, except 60,000 tons of raisin grapes and 18,000 tons of wine grapes in 1928. The values shown are based on the quantity harvested.⁵ Dried basis. To calculate the approximate quantity of fresh grapes used for raisins multiply the production of raisins by 4.

TABLE 214.—*Fruits and nuts: Production and value in California, 1919-1929—Continued*

| Crop and year | Production | Farm value, Dec. 1 | | Crop and year | Production | Farm value, Dec. 1 | |
|--|--------------|--------------------|----------------------|--|--------------|--------------------|----------------------|
| | | Per unit | Total | | | Per unit | Total |
| Grapes (raisin varieties marketed fresh):⁶ | <i>Tons</i> | <i>Dollars</i> | <i>1,000 dollars</i> | Lemons—Contd. | <i>Boxes</i> | <i>Dollars</i> | <i>1,000 dollars</i> |
| 1923..... | 130,000 | 20.00 | 2,600 | 1927..... | 6,000,000 | 3.80 | 22,800 |
| 1924..... | 180,000 | 20.00 | 3,600 | 1928..... | 7,900,000 | 2.60 | 20,540 |
| 1925..... | 378,000 | 20.00 | 7,560 | 1929..... | 5,900,000 | 3.80 | 22,420 |
| 1926..... | 229,000 | 20.00 | 4,580 | Figs, dried: | <i>Tons</i> | | |
| 1927..... | 303,000 | 23.00 | 6,969 | 1919..... | 12,000 | 150.00 | 1,800 |
| 1928..... | 362,000 | 10.00 | 3,620 | 1920..... | 12,300 | 90.00 | 1,107 |
| 1929..... | 238,000 | 30.00 | 7,140 | 1921..... | 9,600 | 145.00 | 1,392 |
| Grapes (table): | | | | 1922..... | 11,000 | 120.00 | 1,320 |
| 1919..... | 200,000 | 75.00 | 15,000 | 1923..... | 9,500 | 90.00 | 855 |
| 1920..... | 166,000 | 75.00 | 12,450 | 1924..... | 8,500 | 100.00 | 850 |
| 1921..... | 163,000 | 80.00 | 13,040 | 1925..... | 9,600 | 110.00 | 1,056 |
| 1922..... | 213,000 | 60.00 | 12,780 | 1926..... | 11,350 | 95.00 | 1,078 |
| 1923..... | 312,000 | 40.00 | 12,480 | 1927..... | 12,000 | 45.00 | 540 |
| 1924..... | 325,000 | 40.00 | 13,000 | 1928..... | 11,500 | 45.00 | 518 |
| 1925..... | 477,000 | 20.00 | 9,540 | 1929..... | 15,000 | 90.00 | 1,350 |
| 1926..... | 398,000 | 25.00 | 9,950 | Olives: | | | |
| 1927..... | 490,000 | 26.00 | 12,740 | 1919..... | 8,800 | 160.00 | 1,408 |
| 1928..... | 473,000 | 26.00 | 12,298 | 1920..... | 8,000 | 95.00 | 760 |
| 1929..... | 317,000 | 35.00 | 11,095 | 1921..... | 8,200 | 90.00 | 738 |
| Grapes (juice): | | | | 1922..... | 10,000 | 125.00 | 1,250 |
| 1919..... | 400,000 | 50.00 | 20,000 | 1923..... | 17,000 | 65.00 | 1,105 |
| 1920..... | 378,000 | 75.00 | 28,325 | 1924..... | 6,500 | 92.00 | 598 |
| 1921..... | 310,000 | 82.00 | 25,420 | 1925..... | 14,000 | 60.00 | 840 |
| 1922..... | 450,000 | 65.00 | 29,250 | 1926..... | 12,000 | 80.00 | 960 |
| 1923..... | 428,000 | 40.00 | 17,120 | 1927..... | 21,500 | 80.00 | 1,720 |
| 1924..... | 350,000 | 63.00 | 22,050 | 1928..... | 23,900 | 80.00 | 1,912 |
| 1925..... | 395,000 | 60.00 | 23,700 | 1929..... | 22,500 | 75.00 | 1,688 |
| 1926..... | 414,000 | 45.00 | 18,630 | Almonds: | | | |
| 1927..... | 473,000 | 45.00 | 21,285 | 1919..... | 7,250 | 440.00 | 3,190 |
| 1928..... | 482,000 | 25.00 | 11,600 | 1920..... | 5,500 | 360.00 | 1,980 |
| 1929..... | 416,000 | 35.00 | 14,560 | 1921..... | 6,000 | 320.00 | 1,920 |
| Oranges:⁷ | <i>Boxes</i> | | | 1922..... | 8,500 | 290.00 | 2,465 |
| 1919..... | 15,265,000 | 2.75 | \$ 42,702 | 1923..... | 11,000 | 260.00 | 2,860 |
| 1920..... | 21,296,000 | 2.18 | \$ 47,088 | 1924..... | 8,000 | 300.00 | 2,400 |
| 1921..... | 12,640,000 | 2.80 | \$ 35,360 | 1925..... | 7,500 | 400.00 | 3,000 |
| 1922..... | 20,106,000 | 2.00 | \$ 40,212 | 1926..... | 16,000 | 300.00 | 4,800 |
| 1923..... | 24,137,000 | 2.00 | \$ 48,274 | 1927..... | 12,000 | 320.00 | 3,840 |
| 1924..... | 18,100,000 | 3.55 | \$ 64,355 | 1928..... | 14,000 | 340.00 | 4,760 |
| 1925..... | 24,200,000 | 2.84 | \$ 68,728 | 1929..... | 4,600 | 480.00 | 2,208 |
| 1926..... | 28,167,000 | 3.05 | \$ 85,909 | Walnuts, English: | | | |
| 1927..... | 23,000,000 | 4.00 | \$ 92,000 | 1919..... | 28,100 | 550.00 | 15,455 |
| 1928..... | 38,705,000 | 2.05 | \$ 79,345 | 1920..... | 21,000 | 400.00 | 8,400 |
| 1929..... | 23,600,000 | 4.00 | \$ 94,400 | 1921..... | 19,500 | 400.00 | 7,800 |
| Grapefruit: | | | | 1922..... | 27,000 | 360.00 | 9,720 |
| 1919..... | 263,000 | | | 1923..... | 25,000 | 400.00 | 10,000 |
| 1920..... | 304,000 | | | 1924..... | 22,500 | 460.00 | 10,350 |
| 1921..... | 360,000 | | | 1925..... | 36,000 | 440.00 | 15,840 |
| 1922..... | 394,000 | | | 1926..... | 15,000 | 480.00 | 7,200 |
| 1923..... | 363,000 | | | 1927..... | 51,000 | 330.00 | 16,830 |
| 1924..... | 387,000 | | | 1928..... | 26,000 | 420.00 | 10,920 |
| 1925..... | 600,000 | | | 1929..... | 39,000 | 320.00 | 12,480 |
| 1926..... | 650,000 | 2.35 | \$ 1,518 | Peaches, Cling-stones (mainly for canning): | | | |
| 1927..... | 720,000 | 3.80 | \$ 2,736 | 1926..... | 327,000 | | |
| 1928..... | 972,000 | 2.50 | \$ 2,430 | 1927..... | \$ 322,000 | 22.50 | 5,783 |
| 1929..... | 1,300,000 | 2.50 | \$ 3,250 | 1928..... | \$ 414,000 | 21.70 | 7,459 |
| Lemons:⁷ | | | | 1929..... | 179,000 | 68.30 | 12,224 |
| 1919..... | 3,499,000 | 2.00 | \$ 6,998 | Peaches, Freestone (mainly for drying): | | | |
| 1920..... | 4,955,000 | 2.92 | \$ 14,469 | 1926..... | 214,000 | | |
| 1921..... | 4,050,000 | 3.45 | \$ 13,973 | 1927..... | 170,000 | 28.80 | 4,896 |
| 1922..... | 3,400,000 | 3.30 | \$ 11,220 | 1928..... | 204,000 | 28.00 | 5,712 |
| 1923..... | 6,732,000 | 1.60 | \$ 10,771 | 1929..... | 146,000 | 41.50 | 6,059 |
| 1924..... | 5,125,000 | 3.48 | \$ 17,835 | | | | |
| 1925..... | 7,316,000 | 2.11 | \$ 15,437 | | | | |
| 1926..... | 7,712,000 | 2.81 | \$ 21,671 | | | | |

Bureau of Agricultural Economics: California estimates in cooperation with California Department of Agriculture; 1929 estimates are preliminary.

⁶ For years prior to 1923 the quantity of raisins marketed fresh was small and has been included with other table grapes.

⁷ Representing the commercial crop year beginning Nov. 1 of the year shown; the numbers for 1929, for instance, represent the fruit that set during the season of 1929 and will be picked and marketed from Nov. 1, 1929, to Oct. 31, 1930.

⁸ Includes value of quantity of grapefruit as shown below.

⁹ Total production includes 66,000 tons not harvested in 1927 and 70,000 tons not harvested in 1928. The values shown are based upon the quantities harvested.

STATISTICS OF FRUITS AND VEGETABLES

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TABLE 215.—Pecans: Estimated production ¹ and value, by States, 1925-1929

PRODUCTION

| State | Improved | | | | | Seedling | | | | | Total | | | | |
|-------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 | 1925 | 1926 | 1927 | 1928 | 1929 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| Ill. | 0 | 0 | 0 | 0 | 0 | 23 | 280 | 90 | 18 | 90 | 23 | 280 | 90 | 18 | 90 |
| Mo. | 12 | 22 | 5 | 8 | 24 | 1,183 | 2,170 | 488 | 396 | 1,160 | 1,195 | 2,102 | 493 | 394 | 1,184 |
| N. C. | 119 | 412 | 427 | 300 | 412 | 94 | 299 | 284 | 240 | 252 | 213 | 711 | 711 | 630 | 664 |
| S. C. | 602 | 1,218 | 902 | 900 | 752 | 258 | 406 | 255 | 200 | 165 | 860 | 1,624 | 1,157 | 1,100 | 917 |
| Ga. | 4,884 | 6,220 | 2,927 | 6,760 | 2,545 | 1,221 | 1,185 | 476 | 840 | 315 | 6,105 | 7,405 | 3,403 | 7,600 | 2,860 |
| Fla. | 1,207 | 1,031 | 801 | 1,500 | 300 | 709 | 485 | 343 | 500 | 100 | 1,916 | 1,516 | 1,144 | 2,000 | 400 |
| Ala. | 1,588 | 2,593 | 1,255 | 2,500 | 1,248 | 617 | 804 | 354 | 500 | 258 | 2,205 | 3,457 | 1,609 | 3,000 | 1,504 |
| Miss. | 1,783 | 1,508 | 1,120 | 3,300 | 1,300 | 3,311 | 3,692 | 2,080 | 3,000 | 1,200 | 5,094 | 5,200 | 3,200 | 6,300 | 2,500 |
| Ark. | 63 | 90 | 60 | 05 | 63 | 2,087 | 2,010 | 1,440 | 1,600 | 993 | 2,100 | 3,000 | 1,500 | 1,695 | 1,050 |
| La. | 830 | 719 | 398 | 760 | 218 | 4,760 | 4,811 | 2,253 | 4,250 | 1,230 | 5,530 | 5,530 | 2,651 | 5,000 | 1,454 |
| Okla. | 35 | 52 | 23 | 20 | 39 | 6,973 | 10,238 | 4,603 | 4,420 | 7,841 | 7,008 | 10,310 | 4,680 | 4,440 | 7,880 |
| Tex. | 53 | 838 | 192 | 765 | 525 | 5,247 | 41,062 | 9,408 | 26,683 | 16,971 | 5,300 | 41,900 | 9,600 | 27,448 | 17,496 |
| U. S. | 11,176 | 14,703 | 8,110 | 16,988 | 7,426 | 26,373 | 68,422 | 22,134 | 42,637 | 30,579 | 37,549 | 83,125 | 30,244 | 59,625 | 38,005 |

PRICE ²

| | Cents | Cents | Cts. | Cents | Cts. | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
|-------|-------|-------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ill. | | | | | | 17 | 17 | 14 | 15 | 15 | 17.4 | 17.1 | 14.4 | 16.7 | 15.5 |
| Mo. | 35 | 32 | 48 | 35 | 30 | 18 | 16 | 20 | 16 | 13 | 18.2 | 16.1 | 20.3 | 16.5 | 13.3 |
| N. C. | 45 | 44 | 40 | 36 | 34 | 30 | 25 | 27 | 22 | 20 | 38.5 | 36.0 | 34.9 | 30.6 | 28.6 |
| S. C. | 45 | 28 | 35 | 33 | 35 | 30 | 21 | 23 | 17 | 20 | 40.5 | 26.2 | 32.4 | 30.1 | 32.3 |
| Ga. | 37 | 31 | 34 | 28 | 31 | 25 | 15 | 17 | 13 | 15 | 34.6 | 28.4 | 31.6 | 26.3 | 29.2 |
| Fla. | 37 | 30 | 33 | 31 | 33 | 22 | 14 | 17 | 16 | 17 | 31.5 | 24.9 | 28.1 | 27.2 | 29.0 |
| Ala. | 40 | 34 | 37 | 30 | 30 | 25 | 19 | 20 | 13 | 16 | 35.8 | 30.3 | 33.3 | 27.2 | 27.6 |
| Miss. | 39 | 37 | 38 | 30 | 32 | 23 | 18 | 19 | 14 | 17 | 28.6 | 23.5 | 25.7 | 22.4 | 24.8 |
| Ark. | 34 | 35 | 35 | 32 | 35 | 18 | 15 | 15 | 14 | 12 | 18.5 | 15.6 | 15.8 | 15.0 | 13.4 |
| La. | 32 | 32 | 38 | 27 | 31 | 17 | 14 | 16 | 10.7 | 15 | 19.3 | 16.3 | 19.3 | 13.1 | 17.4 |
| Okla. | 35 | 30 | 35 | 35 | 39 | 15 | 10 | 13 | 11 | 10.2 | 15.1 | 10.1 | 13.1 | 11.1 | 10.3 |
| Tex. | 34 | 30 | 35 | 35 | 32 | 17 | 11 | 16 | 11.7 | 11 | 17.2 | 11.4 | 16.4 | 12.4 | 11.6 |
| U. S. | 37.8 | 32.2 | 35.6 | 29.7 | 31.8 | 18.2 | 12.1 | 16.0 | 12.0 | 11.5 | 24.1 | 15.7 | 21.2 | 17.0 | 15.5 |

VALUE

| | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. | 1,000 dolls. |
|-------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Ill. | | | | | | 4 | 48 | 13 | 3 | 14 | 4 | 48 | 13 | 3 | 14 |
| Mo. | 4 | 7 | 2 | 3 | 7 | 213 | 347 | 98 | 62 | 151 | 217 | 354 | 100 | 65 | 158 |
| N. C. | 54 | 181 | 171 | 140 | 140 | 28 | 75 | 77 | 53 | 50 | 82 | 256 | 248 | 193 | 190 |
| S. C. | 271 | 341 | 316 | 297 | 263 | 77 | 85 | 59 | 34 | 33 | 348 | 420 | 376 | 331 | 306 |
| Ga. | 1,807 | 1,928 | 995 | 1,893 | 789 | 305 | 178 | 81 | 109 | 47 | 2,112 | 2,106 | 1,076 | 2,002 | 836 |
| Fla. | 447 | 309 | 264 | 465 | 99 | 156 | 68 | 58 | 80 | 17 | 903 | 377 | 322 | 345 | 116 |
| Ala. | 635 | 882 | 464 | 750 | 374 | 154 | 164 | 71 | 65 | 41 | 789 | 1,046 | 535 | 815 | 415 |
| Miss. | 695 | 558 | 426 | 990 | 416 | 762 | 965 | 395 | 420 | 204 | 1,457 | 1,223 | 821 | 1,410 | 620 |
| Ark. | 21 | 32 | 21 | 30 | 22 | 367 | 436 | 216 | 224 | 119 | 388 | 468 | 237 | 264 | 141 |
| La. | 206 | 230 | 151 | 202 | 68 | 799 | 974 | 360 | 455 | 185 | 1,065 | 904 | 511 | 657 | 253 |
| Okla. | 12 | 16 | 8 | 7 | 15 | 1,046 | 1,026 | 608 | 488 | 800 | 1,058 | 1,042 | 614 | 493 | 815 |
| Tex. | 18 | 251 | 67 | 268 | 168 | 892 | 4,517 | 1,505 | 3,122 | 1,967 | 910 | 4,708 | 1,672 | 3,390 | 2,035 |
| U. S. | 4,230 | 4,735 | 2,885 | 5,045 | 2,361 | 4,803 | 8,283 | 3,539 | 5,113 | 3,528 | 9,033 | 13,018 | 6,424 | 10,158 | 5,899 |

¹ Revised estimates based upon a special survey, covering the crop of 1928, carried out by field statisticians of the Division of Crop and Livestock Estimates in the different States.

² Dec. 1 farm prices, except that 1928 prices based mainly on the special survey.

TABLE 216.—*Fruits, canned: Production and value, census years, 1899–1927*

QUANTITY

| Commodity | Standard cases ¹ | | | | | | | Actual cases | |
|--------------------------|-----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | 1899 | 1904 | 1909 | 1914 | 1919 | 1921 | 1923 | 1925 | 1927 |
| | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> |
| Apples..... | 646 | 490 | 1,206 | 1,515 | 2,448 | 2,239 | 2,726 | 3,467 | 2,939 |
| Apricots..... | 532 | 540 | 630 | 1,052 | 3,940 | 1,057 | 1,562 | 2,088 | 3,099 |
| Blackberries..... | | 164 | 211 | 452 | 911 | | | 690 | 626 |
| Loganberries..... | | (²) | | 40 | 274 | | | 386 | 441 |
| Raspberries..... | | 177 | 247 | 415 | 551 | | | 462 | 529 |
| Strawberries..... | | 142 | 208 | 186 | 374 | | | | |
| Berries, other..... | 600 | 6 | 150 | 241 | 237 | 1,257 | 2,447 | 612 | 779 |
| Cherries..... | 114 | 319 | 390 | 543 | 1,363 | 780 | 2,124 | 1,487 | 1,229 |
| Fruits for salad..... | | | | | | (²) | | 506 | 1,101 |
| Grapefruit..... | | | | | | (²) | 200 | 88 | 455 |
| Olives, ripe..... | | | | | | (²) | 803 | 193 | 458 |
| Peaches..... | 1,449 | 1,305 | 1,467 | 3,408 | 7,707 | 5,417 | 7,039 | 10,526 | 11,305 |
| Pears..... | 672 | 789 | 638 | 1,063 | 2,022 | 1,165 | 1,818 | 3,880 | 2,954 |
| Pineapples..... | | | 79 | 94 | 157 | | | | |
| Plums..... | | | 220 | 288 | 572 | | 273 | 222 | 224 |
| Prunes..... | | | | | 274 | | 374 | 380 | 519 |
| Other canned fruits..... | 454 | 695 | 83 | 153 | 604 | 600 | 456 | 628 | 906 |

VALUE

| | | | | | | | | | |
|--------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> |
| Apples..... | 1,125 | 738 | 1,899 | 2,392 | 9,082 | 7,748 | 6,540 | 6,951 | 5,895 |
| Apricots..... | 1,583 | 1,642 | 1,825 | 3,061 | 25,168 | 4,314 | 5,464 | 7,068 | 12,256 |
| Blackberries..... | | 285 | 339 | 789 | 5,080 | | | 2,190 | 1,725 |
| Loganberries..... | | (²) | | | 2,139 | | | 1,539 | 1,641 |
| Raspberries..... | | 409 | 642 | 1,137 | 4,279 | | | 2,338 | 2,614 |
| Strawberries..... | | 343 | 538 | 558 | 3,694 | | | | |
| Berries, other..... | 1,093 | 21 | 236 | 463 | 1,257 | 5,783 | 10,390 | 3,014 | 3,826 |
| Cherries..... | 308 | 826 | 1,019 | 1,629 | 8,451 | 4,481 | 10,668 | 7,253 | 6,490 |
| Fruits for salad..... | | | | | | | 3,018 | 6,972 | 7,575 |
| Grapefruit..... | | | | | | | 792 | 330 | 1,759 |
| Olives, ripe..... | | | | | | | 4,311 | 1,100 | 2,808 |
| Peaches..... | 4,283 | 3,902 | 3,754 | 9,580 | 46,516 | 23,805 | 26,262 | 38,562 | 36,235 |
| Pears..... | 2,188 | 2,193 | 1,833 | 3,454 | 14,203 | 7,539 | 9,390 | 20,898 | 13,067 |
| Pineapples..... | | | 314 | 364 | 1,365 | | | | |
| Plums..... | | | 347 | 438 | 2,228 | | 697 | 701 | 686 |
| Prunes..... | | | | | 1,271 | | 955 | 1,185 | 1,531 |
| Other canned fruits..... | 731 | 1,364 | 269 | 626 | 3,216 | 2,838 | 1,737 | 1,938 | 3,623 |
| Total value..... | 11,311 | 11,723 | 13,015 | 24,807 | 127,949 | 56,568 | 80,224 | 102,639 | 101,731 |

Bureau of Agricultural Economics. Data for 1899 and 1904 compiled from Thirteenth Census of the United States, Vol. X, p. 391. Data for 1909 and 1914 from Census of Manufactures, 1914, vol. 2, pp. 377–379. Data for 1919, 1921, 1923, 1925, and 1927 from Census of Manufactures, bulletins on canning and preserving.

¹Expressed in standard cases of 24 cans as follows: Apples, No. 3; apricots, 1899, 1904, 1909, and 1914, No. 3; 1919, 1921, and 1923, No. 2½; blackberries, No. 2; loganberries, 1914, No. 2; 1919, No. 2½; raspberries, 1904, 1909, and 1914, No. 2; 1919, No. 2½; strawberries, 1904, 1909, and 1914, No. 2; 1919, No. 2½; berries, other, 1899, 1904, 1909, and 1914, No. 2; 1919 includes blueberries, No. 2, and other berries, No. 2½; 1921 and 1923, No. 2; cherries, No. 2; fruits for salad, No. 2; grapefruit, No. 2; olives, ripe, No. 2; peaches, 1899, 1904, 1909, 1914, and 1919, No. 3; 1921 and 1923, No. 2½; pears, 1899, 1904, 1909, 1914, and 1919, No. 3; 1921 and 1923, No. 2½; pineapple, No. 3; plums, 1909 and 1914, No. 2; 1919, No. 2½; 1923, No. 2; prunes, 1919, No. 2½; 1923, No. 2; other canned fruit, 1899 and 1904, No. 2; 1909 and 1914, No. 2, except figs in 1909. No. 3, and figs and grapes in 1914, No. 3; 1919, No. 2½, except grapes, No. 2; 1921 and 1923, No. 3.

²Not reported separately.

TABLE 217.—*Fruits, canned: Quantity, by States and total value, 1927*¹

| State | Apples | Berries | Cherries | Peaches | Pears | Other canned fruit | Total |
|----------------------------------|----------------|----------------|----------------|----------------|----------------|--------------------------|----------------|
| | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases |
| Maine..... | 137 | 241 | | | | | 378 |
| New York..... | 614 | 170 | 266 | | 123 | 239 | 1,412 |
| New Jersey..... | | | | | 6 | | 6 |
| Pennsylvania..... | 292 | | | | | | 292 |
| Ohio..... | | | 36 | | | | 36 |
| Michigan..... | 63 | 168 | 250 | 34 | 146 | 26 | 687 |
| Maryland..... | | 9 | | | 13 | | 22 |
| Georgia..... | | | | 131 | | | 131 |
| Arkansas..... | | 11 | | | | | 11 |
| Texas..... | | 61 | | | | 274 | 335 |
| Colorado..... | | 9 | 60 | | | | 69 |
| Utah..... | | | 38 | 4 | | | 42 |
| Washington..... | 909 | 665 | 94 | | 352 | 1 | 2,021 |
| Oregon..... | 335 | 860 | 228 | | 431 | 261 | 2,115 |
| California..... | | 138 | 174 | 11,110 | 1,859 | 5,247 | 18,537 |
| Other States..... | 589 | 43 | 83 | 17 | 24 | 259 | 1,015 |
| Total..... | 2,939 | 2,375 | 1,229 | 11,305 | 2,954 | 6,762 | 27,564 |
| Total value (1,000 dollars)..... | 5,895 | 9,806 | 6,490 | 36,235 | 13,067 | 30,237 | 101,730 |

Bureau of Agricultural Economics. Compiled from Census of Manufactures, 1927.

¹ Expressed in actual cases.² Includes Arizona and Massachusetts for some commodities.³ Includes Washington for loganberries. ⁴ Includes 455,000 cases of grapefruit not reported by States.TABLE 218.—*Asparagus for consumption fresh, commercial crop: Acreage, production, and price per crate, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per crate | | | |
|---------------------|--------------|--------------|--------------|--------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|----------------------------------|----------------------|----------------------|----------------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 crates</i> ¹ | <i>1,000 crates</i> ¹ | <i>1,000 crates</i> ¹ | <i>1,000 crates</i> ¹ | <i>Dol- lars</i> | <i>Dol- lars</i> | <i>Dol- lars</i> | <i>Dol- lars</i> |
| Early: | | | | | | | | | | | | |
| California..... | 9,980 | 10,080 | 10,400 | 10,780 | 1,856 | 1,341 | 1,633 | 927 | 3.26 | 2.99 | 2.27 | 3.12 |
| Georgia..... | 4,380 | 4,900 | 5,640 | 6,320 | 70 | 118 | 130 | 152 | 3.42 | 3.82 | 2.75 | 3.73 |
| South Carolina..... | 5,300 | 6,400 | 7,000 | 7,700 | 307 | 288 | 280 | 462 | 3.08 | 4.01 | 2.91 | 3.51 |
| Total..... | 19,660 | 21,380 | 23,040 | 24,800 | 2,323 | 1,747 | 2,043 | 1,541 | 3.24 | 3.21 | 2.39 | 3.30 |
| Late: | | | | | | | | | | | | |
| Delaware..... | 1,500 | 1,500 | 1,920 | 1,920 | 90 | 81 | 161 | 192 | 3.00 | 2.70 | 1.65 | 2.85 |
| Illinois..... | 3,050 | 3,360 | 3,700 | 3,880 | 201 | 286 | 303 | 318 | 1.66 | 1.50 | 1.56 | 2.87 |
| Iowa..... | 150 | 200 | 200 | 210 | 9 | 14 | 14 | 20 | 1.65 | 2.00 | 2.00 | 2.50 |
| Maryland..... | 1,920 | 2,120 | 2,330 | 2,330 | 121 | 208 | 252 | 242 | 2.00 | 3.44 | 2.37 | 3.25 |
| Massachusetts..... | | | 1,580 | 1,580 | | | 150 | 145 | | | 3.35 | 3.30 |
| Michigan..... | 390 | 480 | 820 | 860 | 26 | 38 | 80 | 93 | 2.90 | 2.74 | 1.59 | 2.31 |
| New Jersey..... | 10,000 | 10,500 | 10,500 | 10,500 | 740 | 882 | 819 | 861 | 3.05 | 2.80 | 2.45 | 2.50 |
| Oregon..... | | 160 | 180 | 200 | | 13 | 16 | 30 | | 1.75 | 2.00 | 2.25 |
| Pennsylvania..... | 1,000 | 1,000 | 1,200 | 1,280 | 68 | 45 | 91 | 128 | 2.74 | 3.22 | 2.27 | 2.40 |
| Washington..... | 860 | 1,300 | 1,740 | 1,740 | 75 | 130 | 171 | 150 | 2.36 | 1.60 | 1.97 | 1.99 |
| Total..... | 18,870 | 20,620 | 24,170 | 24,500 | 1,330 | 1,697 | 2,057 | 2,179 | 2.67 | 2.56 | 2.22 | 2.67 |
| Grand total..... | 38,530 | 42,000 | 47,210 | 49,300 | 3,563 | 3,444 | 4,100 | 3,720 | 3.03 | 2.89 | 2.31 | 2.93 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

¹ Crate containing approximately 24 pounds.TABLE 219.—*Asparagus for canning, commercial crop. Acreage, production, and price per ton, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per ton | | | |
|-----------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|--------------------------------|----------------------|----------------------|----------------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Dol- lars</i> | <i>Dol- lars</i> | <i>Dol- lars</i> | <i>Dol- lars</i> |
| California..... | 46,300 | 48,300 | 49,300 | 49,400 | 50,900 | 53,100 | 64,100 | 74,100 | 66.29 | 70.00 | 70.36 | 79.40 |
| New York..... | 150 | 200 | 200 | 200 | 100 | 100 | 100 | 140 | 224.50 | 225.00 | 220.00 | 210.00 |
| Total..... | 46,450 | 48,500 | 49,500 | 49,600 | 51,000 | 53,200 | 64,200 | 74,240 | 66.50 | 70.28 | 70.58 | 79.65 |

Bureau of Agricultural Economics. Estimates based upon returns from canning establishments.

TABLE 220.—*Asparagus: Car-lot shipments, by State of origin, 1920-1929*

| State | Crop movement season ¹ | | | | | | | | | |
|-------------------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ² |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New Jersey..... | 465 | 237 | 154 | 64 | 156 | 150 | 226 | 156 | 34 | 33 |
| Illinois..... | 164 | 170 | 161 | 93 | 157 | 165 | 144 | 158 | 213 | 146 |
| South Carolina..... | 89 | 120 | 143 | 154 | 185 | 263 | 364 | 447 | 463 | 506 |
| Georgia..... | | | | | 8 | | 53 | 111 | 158 | 129 |
| Washington..... | 1 | 2 | 5 | 10 | 10 | 31 | 111 | 93 | 127 | 107 |
| California ³ | 502 | 362 | 304 | 458 | 718 | 1,279 | 1,503 | 1,154 | 1,875 | 1,111 |
| Other States..... | 5 | 2 | | 6 | 1 | 18 | 18 | 13 | 7 | 29 |
| Total ³ | 1,226 | 902 | 767 | 785 | 1,235 | 1,906 | 2,419 | 2,132 | 2,877 | 2,061 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop movement season extends from Mar. 1 through July of a given year.

² Preliminary.

³ California includes shipments in other months as follows: 1924, 6 in February; 1925, 10 in February; 1926, 8 in October and 5 in November; 1927, 6 in October and 1 in November; 1928, 24 in October and 7 in November.

TABLE 221.—*Beans, snap, for consumption fresh, commercial crop: Acreage, production, and price per bushel, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per bushel | | | |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------------------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>bush.</i> | <i>bush.</i> | <i>bush.</i> | <i>bush.</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| Fall: ¹ | | | | | 1,000 | 1,000 | 1,000 | 1,000 | | | | |
| Florida..... | 4,980 | 4,700 | 12,050 | 4,500 | 438 | 367 | 602 | 225 | 3.05 | 3.00 | 2.55 | 3.76 |
| Texas..... | 830 | 1,010 | 1,080 | 840 | 76 | 32 | 43 | 63 | 1.51 | 1.50 | 1.13 | 1.65 |
| Total..... | 5,810 | 5,710 | 13,130 | 5,340 | 514 | 399 | 645 | 288 | 2.82 | 2.88 | 2.40 | 3.30 |
| Early: | | | | | | | | | | | | |
| California..... | 3,000 | 3,120 | 3,250 | 3,510 | 645 | 484 | 429 | 446 | 1.76 | 1.25 | 1.60 | 1.68 |
| Florida..... | 11,030 | 14,960 | 16,760 | 16,520 | 739 | 1,049 | 838 | 1,322 | 3.58 | 2.59 | 2.10 | 2.06 |
| Texas..... | 4,410 | 5,210 | 4,950 | 3,380 | 401 | 255 | 530 | 260 | 1.65 | 1.70 | 1.57 | 1.81 |
| Total..... | 18,440 | 23,320 | 24,960 | 23,410 | 1,785 | 1,788 | 1,797 | 2,028 | 2.49 | 2.10 | 1.82 | 1.94 |
| Second Early: | | | | | | | | | | | | |
| Alabama..... | 710 | 960 | 1,000 | 900 | 53 | 73 | 64 | 64 | 2.34 | 1.10 | 1.75 | 1.30 |
| Georgia..... | 1,740 | 1,880 | 1,360 | 600 | 108 | 62 | 68 | 72 | 2.08 | .97 | 1.78 | 1.20 |
| Louisiana..... | 6,920 | 8,910 | 8,610 | 8,100 | 388 | 722 | 405 | 688 | 2.70 | 1.37 | 1.56 | 1.35 |
| Mississippi..... | 3,460 | 4,350 | 5,500 | 5,000 | 239 | 222 | 220 | 335 | 2.44 | 1.24 | 2.21 | 1.18 |
| North Carolina..... | 3,290 | 3,880 | 6,500 | 5,900 | 293 | 330 | 566 | 442 | 1.88 | 2.06 | .99 | 1.32 |
| South Carolina..... | 3,500 | 4,500 | 4,920 | 4,920 | 262 | 243 | 325 | 462 | 2.32 | 1.23 | 1.86 | 1.36 |
| Total..... | 19,620 | 24,480 | 27,890 | 25,420 | 1,343 | 1,652 | 1,648 | 2,063 | 2.34 | 1.44 | 1.53 | 1.31 |
| Intermediate: | | | | | | | | | | | | |
| Arkansas..... | 1,280 | 1,120 | 1,410 | 1,340 | 46 | 68 | 83 | 84 | 1.44 | 1.40 | .96 | 1.41 |
| Delaware..... | 200 | 150 | 130 | 140 | 13 | 18 | 14 | 16 | 1.00 | 1.25 | 1.20 | 1.75 |
| Illinois..... | 330 | 530 | 660 | 660 | 24 | 29 | 39 | 61 | 1.08 | 2.75 | 1.14 | 2.16 |
| Maryland..... | 4,250 | 4,250 | 4,340 | 4,560 | 382 | 340 | 326 | 520 | 1.06 | 1.57 | 1.00 | 1.86 |
| New Jersey..... | 11,000 | 11,300 | 12,000 | 13,200 | 1,320 | 1,469 | 1,440 | 1,580 | 1.00 | 1.45 | 1.47 | 1.27 |
| Tennessee..... | 1,670 | 1,000 | 1,650 | 1,200 | 134 | 65 | 124 | 114 | 1.41 | 1.19 | .93 | 1.53 |
| Virginia..... | 2,000 | 2,000 | 2,300 | 2,070 | 264 | 220 | 214 | 298 | 1.99 | 2.67 | 1.11 | 2.00 |
| Total..... | 20,780 | 20,350 | 22,490 | 23,170 | 2,183 | 2,209 | 2,240 | 2,479 | 1.17 | 1.68 | 1.31 | 1.52 |
| Late: | | | | | | | | | | | | |
| Louisiana..... | 4,460 | 4,360 | 3,820 | 4,720 | 290 | 235 | 279 | 354 | 1.64 | 1.32 | 1.56 | 1.10 |
| Mississippi..... | 910 | 580 | 620 | 1,000 | 46 | 30 | 30 | 40 | 1.80 | 1.38 | 1.98 | 1.60 |
| North Carolina..... | 900 | 400 | 220 | 900 | 53 | 30 | 17 | 39 | 1.00 | 1.50 | 2.50 | 1.20 |
| South Carolina..... | 1,670 | 800 | 800 | 900 | 67 | 60 | 63 | 112 | .64 | 1.12 | 2.73 | 1.50 |
| Virginia..... | 1,170 | 1,300 | 1,170 | 2,000 | 213 | 176 | 105 | 300 | 1.00 | 1.10 | .95 | .90 |
| Total..... | 8,310 | 7,440 | 6,630 | 9,220 | 669 | 531 | 494 | 845 | 1.30 | 1.24 | 1.64 | 1.11 |
| Grand total..... | 72,910 | 81,300 | 95,100 | 86,560 | 6,494 | 6,579 | 6,824 | 7,703 | 1.92 | 1.77 | 1.63 | 1.60 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

¹ Crop planted in fall of preceding year, the marketing of which extends into the year shown.

TABLE 222.—*Beans, snap, for canning, commercial crop: Acreage, production, and price per ton, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Price per ton | | | |
|---------------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|-----------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| Maine..... | 860 | 600 | 970 | 1,000 | 2,000 | 1,400 | 2,300 | 3,400 | 57.00 | 55.83 | 59.70 | 60.00 |
| New York..... | 5,220 | 5,530 | 6,840 | 8,140 | 6,800 | 7,700 | 10,900 | 13,800 | 76.86 | 83.71 | 75.90 | 77.40 |
| Pennsylvania..... | 1,010 | 890 | 1,190 | 1,450 | 1,200 | 1,400 | 2,500 | 1,900 | 41.83 | 50.98 | 58.30 | 57.40 |
| Indiana..... | 850 | 850 | 1,800 | 2,320 | 700 | 2,000 | 3,200 | 3,700 | 55.00 | 55.50 | 55.00 | 55.00 |
| Michigan..... | 2,400 | 2,400 | 2,950 | 3,840 | 2,900 | 2,200 | 4,400 | 3,500 | 51.20 | 53.00 | 58.40 | 59.20 |
| Wisconsin..... | 3,460 | 3,910 | 4,600 | 5,750 | 4,200 | 5,100 | 7,400 | 6,900 | 73.83 | 75.00 | 67.80 | 71.90 |
| Delaware..... | 800 | 400 | 670 | 670 | 700 | 600 | 900 | 900 | 47.00 | 48.75 | 43.30 | 50.00 |
| Maryland..... | 3,310 | 3,300 | 4,360 | 5,450 | 3,000 | 5,000 | 6,500 | 7,600 | 51.91 | 54.92 | 57.50 | 58.00 |
| South Carolina..... | 700 | 700 | 700 | 820 | 1,000 | 1,000 | 1,500 | 1,600 | 42.00 | 45.00 | 45.00 | 50.00 |
| Tennessee..... | 1,080 | 1,250 | 1,220 | 1,220 | 2,400 | 1,800 | 1,800 | 1,500 | 40.81 | 50.00 | 50.00 | 50.00 |
| Mississippi..... | 1,550 | 1,780 | 1,690 | 1,860 | 3,300 | 2,700 | 2,900 | 1,900 | 50.00 | 51.33 | 50.00 | 50.00 |
| Arkansas..... | 630 | 880 | 1,790 | 2,240 | 900 | 1,700 | 2,000 | 2,700 | 50.00 | 50.00 | 51.30 | 51.00 |
| Louisiana..... | 800 | 1,640 | 3,040 | 3,060 | 400 | 2,000 | 2,100 | 5,000 | 50.00 | 50.00 | 50.00 | 50.00 |
| Colorado..... | 700 | 900 | 1,000 | 2,300 | 2,200 | 2,200 | 3,400 | 6,900 | 53.33 | 00.00 | 60.00 | 58.00 |
| Utah..... | 610 | 880 | 1,020 | 1,280 | 1,500 | 2,400 | 2,400 | 2,600 | 49.68 | 53.13 | 58.30 | 63.00 |
| Washington..... | 270 | 370 | 700 | 1,050 | 1,000 | 1,000 | 1,500 | 2,100 | 60.00 | 60.20 | 60.00 | 60.00 |
| Oregon..... | 1,250 | 650 | 650 | 750 | 3,100 | 1,600 | 2,000 | 1,700 | 64.00 | 65.00 | 65.00 | 57.50 |
| California..... | 700 | 450 | 470 | 750 | 3,200 | 2,000 | 1,700 | 3,000 | 81.00 | 85.00 | 80.00 | 75.00 |
| Other States..... | 1,350 | 1,540 | 3,010 | 3,310 | 1,100 | 2,200 | 4,200 | 4,300 | 57.50 | 53.98 | 52.80 | 63.60 |
| Total..... | 27,560 | 28,920 | 39,270 | 47,860 | 41,600 | 46,000 | 63,600 | 75,200 | 60.43 | 62.61 | 61.18 | 62.03 |

Bureau of Agricultural Economics. Estimates based upon returns from canning establishments.

TABLE 223.—*Beans, snap: Car-lot shipments, by State of origin, 1920-1929*

| State | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ¹ |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 43 | 28 | 11 | 33 | 81 | 62 | 39 | 31 | 49 | 60 |
| New Jersey..... | 90 | 111 | 68 | 15 | 100 | 48 | 56 | 203 | 110 | 61 |
| Maryland..... | 150 | 22 | 149 | 49 | 136 | 127 | 197 | 235 | 246 | 214 |
| Virginia..... | 155 | 79 | 268 | 101 | 899 | 570 | 841 | 877 | 657 | 1,014 |
| North Carolina..... | 133 | 128 | 219 | 261 | 559 | 459 | 550 | 504 | 690 | 735 |
| South Carolina..... | 142 | 331 | 503 | 585 | 517 | 334 | 449 | 425 | 439 | 776 |
| Florida..... | 547 | 407 | 750 | 1,818 | 1,093 | 2,083 | 1,004 | 3,403 | 1,780 | 4,150 |
| Tennessee..... | 20 | 23 | 63 | 81 | 248 | 84 | 174 | 45 | 119 | 132 |
| Mississippi..... | 105 | 79 | 252 | 47 | 85 | 88 | 130 | 143 | 192 | 309 |
| Louisiana..... | 35 | 202 | 90 | 107 | 439 | 683 | 588 | 662 | 822 | 1,137 |
| Texas..... | 7 | 39 | 26 | 88 | 210 | 407 | 414 | 471 | 294 | 364 |
| California..... | 17 | 60 | 20 | 26 | 32 | 118 | 127 | 60 | 116 | 78 |
| Other States..... | 20 | 91 | 212 | 87 | 219 | 161 | 195 | 242 | 252 | 446 |
| Total..... | 1,473 | 1,600 | 2,631 | 3,328 | 4,618 | 5,224 | 4,854 | 7,301 | 5,766 | 9,485 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Preliminary.

TABLE 224.—Cabbage, commercial crop: Acreage, production, and price per ton, by States, 1926-1929

| State | Acreage | | | | Production ¹ | | | | Seasonal farm price per ton | | | |
|--------------------------------------|----------------|----------------|----------------|----------------|-------------------------|------------------|----------------|------------------|-----------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| Fall: | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| South Carolina..... | 250 | 300 | 600 | 350 | 1,800 | 1,700 | 2,400 | 2,900 | 34.70 | 22.70 | 46.75 | 68.50 |
| Virginia (Norfolk)..... | 200 | 100 | 180 | 180 | 1,500 | 500 | 900 | 1,100 | 16.20 | 15.00 | 71.08 | 50.00 |
| Total..... | 450 | 400 | 780 | 530 | 3,300 | 2,200 | 3,300 | 4,000 | 26.06 | 21.36 | 53.33 | 63.50 |
| Early: | | | | | | | | | | | | |
| California..... | 6,480 | 6,350 | 6,400 | 5,800 | 42,100 | 40,000 | 38,400 | 31,900 | 28.53 | 18.00 | 31.00 | 21.50 |
| Florida..... | 3,660 | 3,010 | 2,900 | 6,500 | 22,000 | 14,700 | 16,000 | 39,000 | 48.44 | 31.22 | 36.93 | 33.60 |
| Louisiana..... | 3,800 | 5,880 | 8,980 | 8,240 | 20,600 | 30,000 | 51,200 | 38,700 | 52.76 | 20.90 | 23.09 | 22.10 |
| Texas..... | 14,300 | 18,530 | 15,840 | 20,400 | 82,900 | 122,300 | 91,900 | 118,300 | 29.23 | 9.76 | 19.15 | 13.58 |
| Total..... | 28,240 | 33,770 | 34,120 | 40,940 | 167,600 | 207,000 | 197,500 | 227,900 | 34.46 | 14.50 | 23.91 | 19.56 |
| Second early: | | | | | | | | | | | | |
| Alabama..... | 3,900 | 4,200 | 2,400 | 3,000 | 19,500 | 22,700 | 11,800 | 12,000 | 20.17 | 19.60 | 62.62 | 20.00 |
| Georgia..... | 320 | 200 | 100 | 300 | 1,100 | 1,300 | 300 | 3,000 | 38.88 | 20.89 | 30.60 | 20.00 |
| Louisiana..... | 5,770 | 8,600 | 7,150 | 9,350 | 27,100 | 39,600 | 37,200 | 44,900 | 30.83 | 22.31 | 42.54 | 21.70 |
| Mississippi..... | 1,880 | 2,110 | 2,500 | 3,170 | 13,500 | 10,600 | 13,800 | 19,700 | 26.95 | 44.75 | 45.50 | 21.30 |
| North Carolina..... | 620 | 780 | 680 | 850 | 3,100 | 3,300 | 3,400 | 6,000 | 30.00 | 60.75 | 54.00 | 20.00 |
| South Carolina..... | 3,300 | 2,300 | 2,500 | 3,200 | 28,700 | 21,600 | 15,500 | 28,200 | 28.11 | 40.28 | 49.02 | 31.50 |
| Virginia (East Shore & Norfolk)..... | 4,000 | 6,400 | 6,700 | 7,600 | 22,400 | 30,100 | 32,800 | 41,800 | 39.43 | 75.50 | 34.92 | 25.60 |
| Total..... | 19,790 | 24,590 | 22,030 | 27,470 | 115,400 | 129,200 | 114,800 | 155,600 | 29.62 | 39.70 | 43.96 | 24.24 |
| Intermediate: | | | | | | | | | | | | |
| Arkansas..... | | 560 | 1,040 | 980 | | 4,500 | 4,700 | 2,400 | | 42.00 | 14.00 | 12.50 |
| Delaware..... | 300 | 250 | 250 | 250 | 1,900 | 1,700 | 1,400 | 1,700 | 24.00 | 28.00 | 40.00 | 20.00 |
| Illinois..... | 900 | 940 | 1,030 | 980 | 5,800 | 6,200 | 9,300 | 7,300 | 20.57 | 14.37 | 10.60 | 18.00 |
| Iowa..... | 1,000 | 1,080 | 1,250 | 1,000 | 7,500 | 6,900 | 11,900 | 6,400 | 11.12 | 26.37 | 6.06 | 27.10 |
| Kentucky..... | 240 | 240 | 260 | 160 | 1,700 | 1,600 | 1,600 | 1,600 | 20.00 | 40.00 | 15.00 | 30.00 |
| Maryland..... | 1,650 | 1,270 | 1,400 | 1,400 | 8,700 | 7,900 | 9,000 | 9,900 | 52.65 | 52.48 | 22.40 | 20.00 |
| Missouri..... | 860 | 860 | 950 | 860 | 6,900 | 7,300 | 5,200 | 6,000 | 13.50 | 44.22 | 11.25 | 16.62 |
| New Jersey..... | 6,000 | 6,600 | 6,800 | 7,500 | 41,400 | 46,200 | 39,400 | 37,500 | 24.00 | 29.20 | 30.00 | 28.00 |
| New Mexico..... | 500 | 600 | 500 | 600 | 4,000 | 4,200 | 3,500 | 5,400 | 32.23 | 66.20 | 56.25 | 22.00 |
| New York (L. I.)..... | 3,000 | 3,090 | 3,090 | 3,020 | 24,000 | 43,300 | 27,200 | 30,800 | 15.33 | 18.41 | 23.00 | 26.25 |
| Ohio (Wash. Co.)..... | 600 | 850 | 850 | 750 | 3,600 | 7,600 | 8,500 | 6,600 | 37.30 | 38.25 | 16.40 | 35.30 |
| Tennessee..... | 1,560 | 1,750 | 2,120 | 3,000 | 7,800 | 10,500 | 12,900 | 18,000 | 27.20 | 40.88 | 14.06 | 21.65 |
| Virginia (S. W.)..... | 3,660 | 2,450 | 2,200 | 2,200 | 18,300 | 17,200 | 22,000 | 14,500 | 11.86 | 17.29 | 18.02 | 37.50 |
| Washington..... | 1,240 | 1,340 | 1,340 | 1,300 | 12,400 | 13,400 | 9,400 | 11,000 | 28.25 | 60.37 | 19.00 | 11.50 |
| Total..... | 21,510 | 21,880 | 23,080 | 24,000 | 144,000 | 178,500 | 166,000 | 159,100 | 22.48 | 31.15 | 20.90 | 25.07 |
| Late: | | | | | | | | | | | | |
| Colorado..... | 3,220 | 2,600 | 3,100 | 3,300 | 43,800 | 37,700 | 44,600 | 34,000 | 7.20 | 13.90 | 12.97 | 19.94 |
| Indiana..... | 1,990 | 1,190 | 1,510 | 1,960 | 17,500 | 11,900 | 16,200 | 15,100 | 9.10 | 16.60 | 12.78 | 25.57 |
| Michigan..... | 2,960 | 3,120 | 3,170 | 3,320 | 23,100 | 23,160 | 27,300 | 20,900 | 9.48 | 11.68 | 12.56 | 13.59 |
| Minnesota..... | 3,250 | 3,070 | 2,500 | 3,500 | 31,500 | 30,400 | 26,000 | 21,700 | 8.10 | 9.27 | 14.32 | 18.01 |
| New York, other..... | 28,560 | 33,910 | 28,130 | 29,620 | 305,600 | 417,100 | 202,500 | 251,800 | 9.95 | 5.97 | 25.56 | 17.08 |
| Ohio, other..... | 2,620 | 3,510 | 3,040 | 3,336 | 23,600 | 44,200 | 25,800 | 28,000 | 7.09 | 7.54 | 11.36 | 8.75 |
| Oregon..... | 1,710 | 950 | 950 | 1,000 | 17,800 | 9,500 | 8,100 | 5,000 | 17.31 | 18.35 | 31.25 | 27.24 |
| Pennsylvania..... | 1,740 | 1,300 | 1,400 | 1,590 | 15,800 | 15,100 | 10,600 | 13,800 | 20.19 | 20.33 | 26.60 | 18.99 |
| Utah..... | | | 270 | 300 | | | 2,700 | 3,300 | | | 16.00 | 18.00 |
| Wisconsin..... | 13,290 | 13,800 | 13,090 | 16,360 | 127,600 | 114,800 | 138,800 | 129,200 | 9.32 | 8.98 | 15.74 | 15.78 |
| Total..... | 59,340 | 63,150 | 57,160 | 64,280 | 606,300 | 703,800 | 502,600 | 522,800 | 9.86 | 7.97 | 19.36 | 16.80 |
| Grand total..... | 129,330 | 143,790 | 137,170 | 157,220 | 1,036,500 | 1,220,700 | 984,200 | 1,069,400 | 17.84 | 15.86 | 23.63 | 19.87 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

¹ Includes production used in the manufacture of sauerkraut.

STATISTICS OF FRUITS AND VEGETABLES

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TABLE 225.—*Cabbage for sauerkraut, commercial crop: Acreage, production, and price per ton, by States 1926-1929*

| State | Acreage | | | | Production | | | | Price per unit of production | | | |
|-------------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|------------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| New York..... | 3,000 | 3,960 | 4,120 | 4,120 | 37,800 | 63,400 | 30,900 | 39,100 | 6.12 | 6.00 | 12.58 | 10.62 |
| Ohio..... | 1,850 | 2,590 | 2,250 | 2,700 | 20,400 | 33,700 | 19,600 | 23,200 | 6.00 | 7.50 | 7.08 | 7.15 |
| Indiana..... | 1,000 | 360 | 730 | 1,080 | 8,000 | 3,200 | 7,300 | 8,300 | 7.00 | 8.67 | 7.83 | 7.86 |
| Illinois..... | 360 | 360 | 670 | 670 | 2,900 | 4,000 | 6,200 | 5,000 | 7.56 | 8.27 | 12.40 | 15.10 |
| Michigan..... | 1,500 | 1,530 | 1,620 | 1,700 | 15,000 | 13,860 | 13,000 | 10,700 | 6.50 | 6.40 | 7.22 | 7.88 |
| Wisconsin..... | 1,790 | 2,090 | 2,650 | 3,020 | 16,100 | 20,100 | 27,300 | 24,200 | 6.47 | 6.56 | 8.68 | 9.36 |
| Minnesota..... | 420 | 430 | 430 | 500 | 4,400 | 5,200 | 4,600 | 4,000 | 5.00 | 6.25 | 7.00 | 7.35 |
| Colorado..... | 100 | 300 | 500 | 500 | 1,600 | 4,200 | 7,000 | 5,000 | 6.38 | 7.00 | 8.00 | 15.20 |
| Washington..... | 380 | 260 | 260 | 320 | 3,800 | 2,600 | 2,200 | 2,900 | 10.00 | 10.00 | 10.00 | 11.00 |
| Other States..... | 1,760 | 1,920 | 2,110 | 2,300 | 14,100 | 15,700 | 18,100 | 17,900 | 9.97 | 7.03 | 11.33 | 12.00 |
| Total..... | 12,160 | 13,800 | 15,340 | 16,910 | 124,100 | 165,900 | 136,200 | 140,300 | 6.80 | 6.70 | 9.60 | 9.87 |

Bureau of Agricultural Economics. Estimates based upon returns from kraut packers.

TABLE 226.—*Cabbage: Car-lot shipments, by State of origin, 1920-1928*

| State | Crop-movement season ¹ | | | | | | | | |
|---------------------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 ² |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York ³ | 9,315 | 9,315 | 10,274 | 9,080 | 11,816 | 12,545 | 12,808 | 14,080 | 8,588 |
| Pennsylvania ³ | 240 | 300 | 406 | 317 | 409 | 552 | 523 | 420 | 252 |
| Ohio..... | 524 | 318 | 589 | 538 | 658 | 414 | 544 | 765 | 582 |
| Illinois..... | 157 | 107 | 144 | 280 | 279 | 198 | 195 | 193 | 329 |
| Michigan ³ | 598 | 477 | 908 | 732 | 644 | 573 | 287 | 375 | 428 |
| Wisconsin..... | 4,766 | 2,908 | 5,875 | 6,415 | 4,955 | 5,409 | 5,177 | 4,547 | 6,145 |
| Minnesota..... | 895 | 592 | 1,192 | 980 | 1,552 | 873 | 1,125 | 1,009 | 1,493 |
| Iowa..... | 373 | 150 | 566 | 390 | 541 | 265 | 459 | 435 | 566 |
| Maryland..... | 219 | 325 | 448 | 220 | 509 | 238 | 166 | 293 | 266 |
| Virginia..... | 1,546 | 3,537 | 2,952 | 3,343 | 3,390 | 2,220 | 1,805 | 2,742 | 2,459 |
| North Carolina..... | 49 | 251 | 222 | 364 | 275 | 356 | 341 | 292 | 254 |
| South Carolina..... | 1,215 | 3,419 | 3,340 | 4,183 | 1,409 | 3,164 | 2,719 | 1,933 | 2,248 |
| Florida ⁴ | 4,581 | 1,617 | 2,998 | 1,172 | 3,842 | 1,936 | 1,667 | 1,051 | 1,168 |
| Kentucky..... | 112 | 103 | 73 | 85 | 107 | 45 | 17 | 24 | 33 |
| Tennessee..... | 136 | 181 | 563 | 270 | 348 | 317 | 609 | 667 | 823 |
| Alabama..... | 420 | 1,068 | 1,460 | 1,358 | 920 | 1,301 | 1,831 | 1,515 | 886 |
| Mississippi..... | 878 | 509 | 1,029 | 1,134 | 605 | 674 | 990 | 710 | 1,249 |
| Louisiana..... | 203 | 350 | 425 | 330 | 80 | 693 | 435 | 480 | 657 |
| Texas ⁴ | 5,180 | 1,847 | 4,040 | 1,356 | 7,281 | 4,048 | 6,093 | 5,546 | 7,242 |
| Colorado..... | 1,832 | 2,523 | 1,964 | 3,174 | 1,473 | 1,432 | 1,274 | 683 | 1,162 |
| Washington..... | 114 | 170 | 104 | 155 | 52 | 103 | 154 | 139 | 82 |
| California..... | 913 | 1,008 | 647 | 616 | 376 | 860 | 412 | 443 | 702 |
| Other States..... | 364 | 357 | 520 | 473 | 430 | 836 | 794 | 727 | 847 |
| Total..... | 34,826 | 31,432 | 41,348 | 36,989 | 41,951 | 39,052 | 40,515 | 39,069 | 38,461 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop-movement season covers 17 months; from December through the second following April; i. e., the 1920 season begins December, 1919, and ends April, 1921.² Preliminary.³ Figures include shipments in May of succeeding crop year as follows: New York, 1922, 1 car, 1923, 3 cars, 1927, 25 cars, 1928, 1 car; Pennsylvania, 1920, 1 car; Michigan, 1927, 1 car, 1928, 2 cars.⁴ Figures include shipments in November of preceding crop year as follows: Florida, 1928, 5 cars; Texas, 1920, 2 cars, 1922, 4 cars, 1923, 22 cars, 1924, 9 cars, 1925, 12 cars, 1928, 30 cars.

TABLE 227.—*Cabbage, Danish: Monthly average l. c. l. price per ton¹ to jobbers Chicago and New York, 1918-1929*

| Market, and season beginning October ² | Chicago | | | | | | New York | | | | | |
|---|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|---------|---------|
| | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. |
| | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 1918..... | ----- | ----- | ----- | 28.00 | 29.58 | 41.72 | ----- | ----- | 27.73 | 27.07 | 42.36 | ----- |
| 1919..... | 25.82 | 35.64 | 68.00 | 96.56 | 70.17 | ----- | 37.94 | 71.67 | 108.67 | 87.40 | 98.33 | ----- |
| 1920..... | 11.15 | 11.09 | 14.15 | 18.25 | 14.07 | 14.10 | ----- | 18.64 | 15.21 | 18.67 | 14.50 | 16.06 |
| 1921..... | \$41.85 | \$47.03 | \$52.43 | 44.20 | 36.60 | ----- | 39.23 | 41.52 | 49.50 | 52.00 | 40.40 | 42.20 |
| 1922 ³ | ----- | 16.60 | 24.20 | 30.20 | 48.00 | 60.20 | 20.20 | 15.80 | 23.60 | 26.60 | 41.60 | 63.20 |
| 1923..... | ----- | 17.00 | 22.60 | 33.20 | 32.00 | ----- | 26.60 | 20.20 | 27.20 | 33.20 | 39.40 | 48.80 |
| 1924..... | ----- | ----- | \$30.20 | \$30.85 | \$28.00 | \$25.68 | 17.60 | 18.40 | 18.60 | 28.80 | 22.60 | 15.40 |
| 1925..... | \$22.40 | \$40.00 | 42.25 | 54.87 | 53.50 | ----- | 23.16 | 29.24 | 37.54 | 56.09 | 60.66 | 56.35 |
| 1926..... | 13.68 | 24.50 | 25.00 | 21.65 | ----- | ----- | 21.76 | 22.54 | 31.17 | 25.69 | 18.70 | 20.71 |
| 1927 ⁴ | 19.80 | 19.40 | 19.40 | 17.80 | 16.20 | ----- | 18.42 | 15.32 | 14.90 | 15.31 | \$14.40 | 20.04 |
| 1928 ⁴ | 25.60 | 35.60 | 46.40 | 56.80 | ----- | ----- | 41.46 | 36.90 | 43.88 | 50.32 | 46.41 | ----- |
| 1929..... | 27.00 | 24.18 | 35.69 | ----- | ----- | ----- | 30.20 | 28.98 | 34.75 | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units or vice versa in order to obtain comparability.

¹ Unless otherwise stated, quotations are on bulk per ton sales.

² The season during which Danish cabbage prices are obtainable usually runs from October to March of the following year.

³ Sacked per ton delivered.

⁴ Converted from hundredweight price.

TABLE 228.—*Cantaloupes, commercial crop: Acreage, production, and price per crate, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per crate | | | |
|----------------------------|----------------|----------------|----------------|----------------|--------------------|--------------------|--------------------|--------------------|-------------------------------|--------------|--------------|--------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| Early: | | | | | | | | | | | | |
| California (Imperial)..... | Acres 35,300 | Acres 37,920 | Acres 33,460 | Acres 38,360 | 1,000 crates 5,048 | 1,000 crates 6,029 | 1,000 crates 6,224 | 1,000 crates 6,713 | Dollars 1.29 | Dollars 1.49 | Dollars 1.60 | Dollars 1.63 |
| Florida..... | 380 | 420 | 920 | 500 | 30 | 34 | 37 | 50 | 1.30 | 2.23 | 2.00 | 2.00 |
| Georgia..... | 700 | 710 | 650 | 700 | 70 | 57 | 52 | 48 | 1.38 | .76 | 1.50 | 2.22 |
| Texas (Lower V.)..... | 350 | 180 | 100 | 100 | 35 | 21 | 11 | 15 | 1.00 | 1.54 | 1.20 | 2.00 |
| Total..... | 36,730 | 39,230 | 35,130 | 39,560 | 5,183 | 6,141 | 6,324 | 6,826 | 1.29 | 1.49 | 1.60 | 1.64 |
| Intermediate: | | | | | | | | | | | | |
| Arizona..... | 7,000 | 10,000 | 10,000 | 11,500 | 1,400 | 1,900 | 1,800 | 2,024 | 1.32 | 1.46 | 1.34 | 1.25 |
| Arkansas..... | 7,310 | 5,410 | 6,170 | 3,890 | 439 | 406 | 580 | 300 | 1.36 | 2.19 | 1.02 | 1.22 |
| California (other)..... | 8,380 | 7,800 | 10,250 | 12,100 | 1,575 | 1,513 | 2,112 | 2,323 | 1.60 | 1.80 | 1.07 | .99 |
| Delaware..... | 2,000 | 2,000 | 3,200 | 3,200 | 240 | 220 | 371 | 272 | .90 | 1.25 | 1.00 | 1.50 |
| Illinois..... | 400 | 200 | 420 | 420 | 26 | 6 | 45 | 44 | 1.08 | 1.90 | 1.20 | 1.45 |
| Indiana..... | 4,340 | 4,380 | 4,640 | 4,180 | 496 | 504 | 521 | 418 | 1.41 | 1.92 | 1.23 | 1.50 |
| Maryland..... | 6,120 | 7,100 | 6,040 | 6,280 | 988 | 888 | 676 | 534 | 1.42 | 2.20 | 1.21 | 1.45 |
| Nevada..... | 160 | 100 | 250 | 100 | 20 | 19 | 50 | 22 | 1.18 | 1.00 | .80 | 2.00 |
| North Carolina..... | 2,100 | 2,310 | 2,310 | 1,000 | 176 | 266 | 261 | 70 | .88 | .97 | .98 | 1.20 |
| Oklahoma..... | 630 | 330 | 500 | 500 | 41 | 30 | 34 | 38 | .80 | 1.00 | .89 | 1.25 |
| South Carolina..... | 620 | 750 | 640 | 510 | 65 | 68 | 56 | 26 | .72 | .97 | 1.31 | 1.90 |
| Texas (other)..... | 2,030 | 2,030 | 1,610 | 2,230 | 162 | 152 | 145 | 165 | 1.91 | .78 | .50 | 1.16 |
| Total..... | 41,090 | 42,410 | 46,030 | 45,910 | 5,632 | 5,972 | 6,654 | 6,236 | 1.40 | 1.69 | 1.15 | 1.20 |
| Late: | | | | | | | | | | | | |
| Colorado..... | 11,670 | 12,100 | 9,000 | 11,000 | 1,084 | 1,537 | 1,170 | 2,530 | 1.17 | 1.08 | .94 | .83 |
| Iowa..... | 1,120 | 1,130 | 780 | 580 | 134 | 120 | 78 | 39 | 1.50 | 1.00 | 1.06 | 1.48 |
| Kansas..... | 450 | 450 | 450 | 450 | 63 | 52 | 57 | 54 | 1.17 | 1.25 | .92 | .81 |
| Michigan..... | 1,280 | 1,220 | 1,830 | 1,900 | 134 | 168 | 137 | 224 | 1.30 | 1.23 | 1.35 | 1.35 |
| Nevada..... | 350 | 300 | 170 | 280 | 46 | 57 | 30 | 43 | 1.12 | 1.00 | 1.70 | 1.75 |
| New Jersey..... | 4,500 | 4,000 | 3,400 | 3,300 | 518 | 440 | 544 | 368 | .65 | .75 | .95 | 1.88 |
| New Mexico..... | 2,600 | 2,500 | 1,400 | 1,700 | 442 | 250 | 189 | 212 | 1.06 | 1.00 | 1.10 | 1.00 |
| Tennessee..... | 600 | 480 | 470 | 250 | 39 | 32 | 33 | 20 | 1.15 | 1.35 | 1.05 | 1.50 |
| Washington..... | 1,300 | 1,960 | 2,000 | 2,100 | 218 | 245 | 200 | 252 | 1.28 | 2.12 | .61 | .76 |
| Total..... | 23,870 | 24,140 | 19,500 | 21,260 | 3,578 | 2,901 | 2,438 | 3,737 | 1.10 | 1.10 | .97 | .99 |
| Grand total..... | 101,690 | 105,780 | 100,680 | 106,730 | 14,393 | 15,014 | 15,416 | 16,799 | 1.29 | 1.49 | 1.30 | 1.33 |

Bureau of Agricultural Economics, estimates based upon returns from crop reporters.

¹ Standard crate.

TABLE 229.—*Cantaloupes: ¹ Car-lot shipments, by State of origin, 1920-1929*

| State | Crop movement season ² | | | | | | | | | |
|---------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ³ |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| Indiana..... | 632 | 644 | 804 | 681 | 822 | 1,089 | 629 | 415 | 465 | 387 |
| Michigan..... | 209 | 232 | 465 | 306 | 114 | 146 | 84 | 77 | 52 | 16 |
| Delaware..... | 600 | 942 | 843 | 818 | 511 | 657 | 551 | 427 | 427 | 285 |
| Maryland..... | 781 | 1,153 | 1,233 | 1,270 | 699 | 1,116 | 1,283 | 1,159 | 1,002 | 561 |
| North Carolina..... | 358 | 894 | 700 | 620 | 401 | 655 | 401 | 606 | 304 | 88 |
| South Carolina..... | 131 | 281 | 270 | 70 | 116 | 33 | 173 | 179 | 94 | 44 |
| Georgia..... | 387 | 619 | 1,632 | 217 | 586 | 117 | 136 | 108 | 104 | 76 |
| Arkansas..... | 986 | 1,554 | 1,002 | 337 | 1,052 | 1,245 | 1,127 | 788 | 854 | 418 |
| Texas..... | 169 | 156 | 186 | 387 | 456 | 408 | 514 | 242 | 244 | 176 |
| Colorado..... | 2,482 | 3,288 | 4,420 | 2,306 | 3,229 | 3,837 | 5,108 | 3,980 | 2,789 | 4,661 |
| New Mexico..... | 968 | 508 | 275 | 364 | 518 | 574 | 640 | 415 | 370 | 352 |
| Arizona..... | 1,159 | 1,504 | 1,558 | 1,208 | 2,145 | 3,833 | 3,712 | 5,217 | 5,901 | 5,457 |
| Washington..... | 380 | 208 | 371 | 207 | 208 | 221 | 145 | 252 | 258 | 363 |
| California..... | 13,251 | 13,166 | 15,304 | 16,486 | 19,930 | 18,707 | 18,320 | 22,406 | 25,307 | 26,843 |
| Other States..... | 460 | 666 | 777 | 646 | 617 | 1,091 | 601 | 486 | 523 | 261 |
| Total..... | 22,953 | 25,815 | 29,930 | 25,923 | 31,494 | 33,819 | 33,424 | 36,757 | 38,694 | 39,998 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Includes honeysuckles and other miscellaneous melons not separately reported until 1923. The shipments of melons, other than cantaloupes, amounted in 1923 to 1,152 cars; in 1924 to 2,565; in 1925 to 3,654; in 1926 to 6,484; in 1927 to 6,516; in 1928 to 9,719; and in 1929 to 11,807.

² Crop-movement season extends from Apr. 1 through November of a given year.

³ Preliminary.

⁴ Figures for California include shipments in December as follows: 1920, 1 car; 1925, 18 cars; 1926, 3 cars; 1927, 4 cars; 1928, 2 cars.

TABLE 230.—*Carrots, commercial crop: Acreage, production, and price per bushel, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per bushel | | | |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------------------------|-------------|-------------|-------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>bush.</i> | <i>bush.</i> | <i>bush.</i> | <i>bush.</i> | <i>Dol-</i> | <i>Dol-</i> | <i>Dol-</i> | <i>Dol-</i> |
| Fall: California..... | 640 | 860 | 1,840 | 2,900 | 344 | 458 | 861 | 1,595 | 0.72 | 0.79 | 0.34 | 0.70 |
| Early: Texas..... | 3,920 | 4,340 | 6,450 | 7,510 | 1,047 | 998 | 1,354 | 1,885 | .32 | .43 | .48 | .31 |
| Second early: | | | | | | | | | | | | |
| California..... | 1,160 | 2,190 | 3,020 | 4,430 | 623 | 1,064 | 1,540 | 1,312 | .72 | .68 | .93 | .62 |
| Louisiana..... | 7,330 | 11,600 | 8,010 | 6,220 | 1,261 | 2,448 | 1,370 | 1,051 | .70 | .51 | .51 | .62 |
| Mississippi..... | 1,500 | 2,040 | 1,750 | 1,000 | 300 | 551 | 413 | 185 | 1.23 | .56 | .33 | .71 |
| Total..... | 9,990 | 15,830 | 12,780 | 13,650 | 2,194 | 4,063 | 3,323 | 4,348 | .78 | .56 | .68 | .58 |
| Intermediate: | | | | | | | | | | | | |
| New Jersey..... | 1,400 | 1,400 | 1,900 | 1,900 | 350 | 336 | 380 | 437 | 1.00 | .92 | 1.18 | 1.10 |
| North Carolina..... | | 680 | 450 | 400 | | 136 | 90 | 70 | | .55 | .48 | .60 |
| Virginia..... | | 250 | 540 | 550 | | 75 | 135 | 124 | | .80 | .75 | .85 |
| Total..... | 1,400 | 2,330 | 2,890 | 2,850 | 350 | 547 | 605 | 631 | 1.00 | .81 | .98 | 1.00 |
| Late: | | | | | | | | | | | | |
| Colorado..... | | | 600 | 850 | | | 144 | 238 | | | .90 | .45 |
| Illinois..... | 800 | 800 | 800 | 352 | 356 | 352 | 230 | .75 | .66 | .90 | .50 | |
| Minnesota..... | | | 60 | 80 | | | 29 | .53 | | | .60 | .52 |
| New York..... | 2,250 | 2,140 | 2,120 | 2,200 | 1,246 | 1,338 | 856 | 1,181 | .51 | .46 | 1.00 | .64 |
| Total..... | 3,050 | 2,940 | 3,580 | 3,630 | 1,598 | 1,694 | 1,381 | 1,702 | .56 | .50 | .96 | .62 |
| Grand total..... | 19,000 | 26,300 | 27,540 | 30,570 | 5,523 | 7,760 | 7,524 | 10,161 | .64 | .56 | .68 | .58 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

¹ Includes 300,000 bushels not harvested.

TABLE 231.—Carrots: Car-lot shipments by State of origin, 1920-1928

| State | Crop-movement season ¹ | | | | | | | | |
|-------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 1, 158 | 1, 247 | 1, 523 | 1, 410 | 2, 262 | 1, 825 | 1, 845 | 2, 430 | 1, 484 |
| New Jersey..... | 32 | 32 | 26 | 34 | 18 | 48 | 44 | 85 | 67 |
| Illinois..... | 53 | 62 | 82 | 24 | 3 | 23 | 2 | 13 | 96 |
| Michigan..... | 11 | 33 | 25 | 35 | 55 | 54 | 77 | 91 | 208 |
| Virginia..... | 3 | 1 | 10 | 2 | 1 | 40 | 10 | 44 | 137 |
| Mississippi..... | 77 | 81 | 304 | 142 | 266 | 197 | 209 | 496 | 230 |
| Louisiana..... | 28 | 43 | 62 | 58 | 32 | 106 | 70 | 177 | 99 |
| Texas..... | 5 | 198 | 48 | 65 | 282 | 575 | 1, 136 | 903 | 1, 685 |
| Colorado..... | 1 | 9 | 4 | 12 | 26 | 29 | 62 | 10 | 216 |
| California..... | 111 | 19 | 21 | 24 | 157 | 278 | 557 | 2, 363 | 2, 938 |
| Other States..... | 123 | 115 | 151 | 173 | 212 | 252 | 290 | 241 | 295 |
| Total..... | 1, 602 | 1, 840 | 2, 256 | 1, 979 | 3, 314 | 3, 427 | 4, 302 | 6, 853 | 7, 455 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop-movement season begins in October of the previous year in such early shipping States as California, Texas, and Louisiana and extends through June of the following year in order to include shipments from storage in Northern States and to have totals comparable with acreage and production figures.

TABLE 232.—Cauliflower, commercial, crop: Acreage, production, and price per crate, by States, 1926-1929

| State | Acreage | | | | Production | | | | Seasonal farm price per crate | | | |
|--|--------------|--------------|--------------|--------------|---------------------|---------------------|---------------------|---------------------|-------------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 crates</i> | <i>1,000 crates</i> | <i>1,000 crates</i> | <i>1,000 crates</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| Early: | | | | | | | | | | | | |
| California (spring) ¹ | 10, 500 | 8, 950 | 12, 800 | 14, 000 | 3, 224 | 2, 452 | 3, 558 | 4, 186 | 0.88 | 1.00 | 0.84 | 0.69 |
| Oregon..... | 4, 000 | 1, 450 | 940 | 1, 000 | 624 | 177 | 146 | 70 | .45 | 1.05 | 1.40 | 1.00 |
| Total..... | 14, 500 | 10, 400 | 13, 740 | 15, 000 | 3, 848 | 2, 629 | 3, 704 | 4, 256 | .81 | 1.00 | .86 | .70 |
| Late: | | | | | | | | | | | | |
| Colorado..... | 1, 100 | 1, 160 | 1, 700 | 3, 600 | 99 | 336 | 510 | 1, 296 | 1.15 | 1.78 | 1.20 | .70 |
| New Jersey..... | 300 | 300 | 200 | 270 | 44 | 45 | 26 | 38 | 1.15 | 1.50 | 1.50 | 1.75 |
| New York..... | 5, 560 | 5, 060 | 4, 620 | 5, 330 | 1, 334 | 794 | 545 | 602 | 1.36 | 1.83 | 1.64 | 1.51 |
| Oregon (fall)..... | 650 | 920 | 900 | 900 | 244 | 320 | 202 | 207 | 1.49 | 1.10 | 1.00 | 1.00 |
| Utah..... | 60 | 180 | 270 | 280 | 12 | 49 | 44 | 51 | 2.00 | 2.00 | 1.60 | 1.40 |
| Total..... | 7, 670 | 7, 620 | 7, 690 | 10, 360 | 1, 733 | 1, 544 | 1, 327 | 2, 194 | 1.37 | 1.66 | 1.37 | .98 |
| Grand total..... | 22, 170 | 18, 020 | 21, 430 | 25, 360 | 5, 581 | 4, 173 | 5, 031 | 6, 450 | .98 | 1.25 | 1.00 | .79 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

¹ Season in California begins in October of the previous year.

TABLE 233.—*Cauliflower: Car-lot shipments, by State of origin, 1920-1928*

| State | Crop-movement season ¹ | | | | | | | | |
|-------------------------------|-----------------------------------|-------------|-------------|-------------|-------------|------------------|------------------|------------------|-------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 ² |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 781 | 567 | 683 | 653 | 734 | 834 | 1,019 | 696 | 574 |
| Colorado ³ | | 3 | 4 | 101 | 61 | 191 | 220 | 411 | 843 |
| Oregon..... | 76 | 134 | 282 | 374 | 109 | 1,246 | 780 | 559 | 501 |
| California ⁴ | 2,957 | 3,640 | 3,613 | 3,034 | 3,408 | 4,353 | 4,730 | 7,040 | 7,535 |
| Other States..... | 39 | 30 | 35 | 121 | 146 | ⁵ 100 | ⁶ 143 | ⁷ 340 | 447 |
| Total..... | 3,853 | 4,374 | 4,017 | 4,283 | 4,458 | 6,724 | 6,892 | 9,046 | 9,900 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop-movement season extends from July 1 through June of the following year.

² Preliminary.

³ Totals include figures in June of preceding crop year as follows: 1925, 1 car; 1928, 1 car.

⁴ Totals include figures in succeeding crop year as follows: 1921, 4 cars in August and 7 in September; 1922, 7 cars in July, 5 in August, and 8 in September; 1924, 4 cars in July; 1927, 1 car in July.

⁵ Includes 2 cars in July, 1926, from Virginia.

⁶ Includes 1 car in May and 6 in June, 1926, from Washington.

⁷ Includes 12 cars in June, 1927, from Washington.

TABLE 234.—*Celery, commercial crop: Acreage, production, and price per crate, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per crate | | | |
|-------------------------------|--------------|--------------|--------------|--------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|-------------------------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 crates</i> ¹ | <i>1,000 crates</i> ¹ | <i>1,000 crates</i> ¹ | <i>1,000 crates</i> ¹ | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| Early: | | | | | | | | | | | | |
| California ² | 6,250 | 8,550 | 9,050 | 8,850 | 1,369 | 2,078 | 1,810 | 2,002 | 1.49 | 1.82 | 1.54 | 1.54 |
| Florida..... | 3,520 | 4,240 | 5,380 | 6,500 | 1,320 | 1,908 | 2,206 | 2,340 | 3.00 | 2.08 | 2.83 | 2.15 |
| Total..... | 9,770 | 12,790 | 14,430 | 15,350 | 2,689 | 3,986 | 4,016 | 4,342 | 2.23 | 1.94 | 2.26 | 1.83 |
| Late: | | | | | | | | | | | | |
| Colorado..... | 940 | 940 | 900 | 1,050 | 282 | 282 | 270 | 252 | 1.22 | 1.70 | 1.65 | 1.10 |
| Idaho..... | | | 60 | 130 | | | 47 | 102 | | | 1.35 | 1.34 |
| Michigan..... | 3,720 | 3,760 | 3,990 | 4,150 | 521 | 846 | 1,237 | 1,303 | 1.92 | 1.38 | 1.22 | 1.42 |
| New Jersey..... | 1,350 | 1,300 | 1,320 | 1,130 | 417 | 370 | 244 | 241 | 1.09 | .82 | 1.05 | 1.58 |
| New York..... | 4,890 | 4,620 | 4,590 | 5,100 | 1,506 | 1,714 | 1,299 | 1,362 | 1.50 | 1.20 | 1.75 | 1.46 |
| Ohio..... | 540 | 450 | 520 | 540 | 120 | 128 | 139 | 137 | 1.68 | 2.43 | 2.05 | 1.50 |
| Oregon..... | 360 | 410 | 410 | 450 | 144 | 178 | 154 | 162 | 1.83 | 1.81 | 1.48 | 1.65 |
| Pennsylvania..... | 260 | 280 | 270 | 230 | 88 | 81 | 71 | 61 | 1.46 | 1.42 | 1.83 | 1.67 |
| Utah..... | | | 550 | 600 | | | 147 | 124 | | | 1.00 | 1.00 |
| Total..... | 12,060 | 11,760 | 12,610 | 13,380 | 3,078 | 3,599 | 3,608 | 3,744 | 1.51 | 1.32 | 1.48 | 1.42 |
| Grand total..... | 21,830 | 24,550 | 27,040 | 28,730 | 5,767 | 7,585 | 7,624 | 8,086 | 1.85 | 1.65 | 1.88 | 1.65 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

¹ New York crate (two-thirds size)

² Season in California begins in fall of previous year.

TABLE 235.—*Celery: Car-lot shipments, by State of origin, 1920-1928*

| State | Crop-movement season ¹ | | | | | | | | |
|-------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 ² |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 3,110 | 3,047 | 3,217 | 3,742 | 4,529 | 4,492 | 4,898 | 5,907 | 4,192 |
| New Jersey..... | 94 | 219 | 115 | 219 | 177 | 149 | 138 | 106 | 32 |
| Pennsylvania..... | 186 | 224 | 212 | 223 | 225 | 208 | 194 | 169 | 71 |
| Ohio..... | 46 | 67 | 76 | 55 | 64 | 71 | 51 | 63 | 54 |
| Michigan..... | 954 | 1,031 | 1,626 | 1,486 | 1,332 | 2,224 | 1,880 | 1,996 | 2,137 |
| Florida..... | 2,652 | 4,218 | 4,954 | 6,398 | 7,219 | 7,952 | 5,504 | 7,499 | 8,413 |
| Colorado..... | 305 | 211 | 222 | 125 | 197 | 399 | 211 | 161 | 188 |
| Oregon..... | 16 | 53 | 82 | 205 | 363 | 398 | 511 | 625 | 605 |
| California..... | 3,472 | 2,617 | 4,334 | 4,631 | 4,240 | 5,953 | 7,565 | 7,837 | ³ 9,569 |
| Other States..... | 24 | 19 | 52 | 76 | 83 | 67 | 48 | 108 | 202 |
| Total..... | 10,859 | 11,706 | 14,920 | 17,160 | 18,429 | 21,913 | 21,000 | 24,471 | 25,463 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the Bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop-movement season covers 19 months, from December through the second following June; i. e., the 1920 season begins December, 1919, and ends June, 1921.

² Preliminary.

³ Includes 1 car in July 1929.

TABLE 236.—*Corn, sweet, for canning, commercial crop: Acreage, production, and price per ton, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Price per ton | | | |
|--------------------|------------------|------------------|--------------|--------------|------------------|------------------|-------------|-------------|------------------|------------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| Maine..... | 14,650 | 8,260 | 10,770 | 14,850 | 46,900 | 23,100 | 30,200 | 46,000 | 28.72 | 22.30 | 24.70 | 24.70 |
| New Hampshire..... | 1,050 | 780 | 1,110 | 1,320 | 2,400 | 1,800 | 2,600 | 3,300 | 23.65 | 21.60 | 23.70 | 23.80 |
| Vermont..... | 2,290 | 1,870 | 1,940 | 2,370 | 5,000 | 2,400 | 4,700 | 6,200 | 21.30 | 19.10 | 18.30 | 18.20 |
| New York..... | 27,420 | 20,290 | 27,000 | 24,600 | 60,300 | 32,500 | 32,400 | 36,900 | 18.24 | 18.80 | 16.50 | 17.00 |
| Pennsylvania..... | 4,840 | 2,800 | 4,140 | 4,471 | 9,700 | 3,600 | 4,100 | 4,500 | 13.00 | 12.00 | 13.80 | 15.00 |
| Ohio..... | 26,380 | 18,730 | 27,910 | 27,700 | 71,200 | 30,000 | 39,100 | 52,600 | 10.14 | 10.00 | 10.80 | 11.20 |
| Indiana..... | 30,380 | 17,010 | 27,390 | 28,200 | 88,100 | 23,800 | 38,300 | 33,800 | 10.18 | 10.41 | 13.00 | 13.00 |
| Illinois..... | 58,280 | 40,650 | 58,300 | 62,220 | 145,700 | 81,300 | 128,300 | 124,400 | 14.23 | 11.06 | 12.70 | 12.80 |
| Michigan..... | 11,080 | 9,400 | 8,930 | 8,220 | 22,200 | 14,100 | 16,100 | 8,200 | 12.54 | 12.98 | 12.40 | 12.50 |
| Wisconsin..... | 17,350 | 10,410 | 14,780 | 14,780 | 29,500 | 13,500 | 29,600 | 32,500 | 11.81 | 10.66 | 11.60 | 11.80 |
| Minnesota..... | 24,450 | 26,420 | 33,000 | 43,900 | 73,400 | 50,200 | 85,800 | 101,000 | 9.93 | 10.00 | 10.80 | 11.00 |
| Iowa..... | 50,480 | 26,750 | 39,860 | 43,450 | 151,400 | 61,500 | 99,660 | 108,600 | 10.35 | 8.96 | 9.30 | 9.90 |
| Nebraska..... | 6,970 | 4,600 | 5,470 | 5,740 | 18,800 | 11,500 | 9,800 | 10,900 | 10.07 | 8.32 | 9.40 | 10.00 |
| Delaware..... | 3,000 | 3,500 | 4,060 | 3,900 | 7,200 | 8,400 | 7,300 | 5,800 | 13.35 | 10.60 | 12.00 | 13.00 |
| Maryland..... | 33,850 | 27,500 | 35,500 | 38,700 | 74,500 | 49,500 | 63,200 | 50,300 | 14.08 | 11.78 | 14.00 | 15.00 |
| Tennessee..... | (¹) | (¹) | 3,100 | 3,400 | (¹) | (¹) | 5,300 | 6,800 | (¹) | (¹) | 13.00 | 13.00 |
| Other States..... | 4,840 | 4,380 | 2,700 | 3,250 | 9,700 | 7,000 | 6,500 | 7,500 | 12.00 | 13.40 | 11.50 | 12.00 |
| Total..... | 317,310 | 223,350 | 305,960 | 331,070 | 816,000 | 414,200 | 592,900 | 639,300 | 13.23 | 11.96 | 12.64 | 13.19 |

Bureau of Agricultural Economics. Estimates based upon returns from canning establishments.

¹ Included in Other States prior to 1923.

TABLE 237.—*Corn, canned: Pack¹ in the United States, 1917-1929*

| State | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> |
| Maine..... | 557 | 1,113 | 1,652 | 1,888 | 911 | 1,066 | 923 | 1,204 | 1,693 | 1,347 | 806 | 966 | 1,521 |
| New York..... | 257 | 489 | 1,014 | 829 | 564 | 616 | 434 | 749 | 1,311 | 1,038 | 676 | 666 | 782 |
| Ohio..... | 1,290 | 1,584 | 1,360 | 1,544 | 850 | 1,073 | 1,390 | 787 | 2,375 | 1,735 | 846 | 1,138 | 1,551 |
| Indiana..... | 742 | 513 | 350 | 861 | 709 | 665 | 1,208 | 846 | 2,223 | 2,044 | 703 | 1,131 | 1,250 |
| Illinois..... | 2,422 | 2,199 | 2,225 | 2,271 | 1,711 | 1,939 | 2,833 | 2,310 | 4,030 | 3,053 | 1,961 | 3,017 | 3,153 |
| Wisconsin..... | 166 | 373 | 635 | 590 | 576 | 625 | 648 | 388 | 1,148 | 843 | 310 | 578 | 547 |
| Minnesota..... | 202 | 309 | 456 | 643 | 673 | 598 | 898 | 1,199 | 1,541 | 1,762 | 1,088 | 1,648 | 2,604 |
| Iowa..... | 2,280 | 2,300 | 2,496 | 3,246 | 1,190 | 1,959 | 2,382 | 1,764 | 4,105 | 3,361 | 1,377 | 2,541 | 2,908 |
| Maryland..... | 2,602 | 2,633 | 2,081 | 2,217 | 1,130 | 1,944 | 2,256 | 1,707 | 3,678 | 2,133 | 1,493 | 1,618 | 1,865 |
| Other States..... | 965 | 809 | 1,045 | 1,251 | 629 | 934 | 1,134 | 1,087 | 2,216 | 1,753 | 1,087 | 1,164 | 1,306 |
| United States..... | 10,803 | 11,722 | 13,550 | 15,040 | 8,843 | 11,419 | 14,106 | 12,131 | 24,320 | 19,069 | 10,347 | 14,497 | 17,487 |

Bureau of Agricultural Economics. Compiled from National Cannery Association data, 1917-1926; Census of Manufactures, 1927-1928; 1929, The American Grocer, Dec. 18, 1929.

¹ Stated in cases of 24 No. 2 cans.

TABLE 238.—*Cucumbers for consumption, fresh, commercial crop: Acreage, production, and price per bushel, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per bushel | | | |
|--------------------------|--------------|--------------|--------------|--------------|--------------------|--------------------|--------------------|--------------------|--------------------------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| Fall: Florida..... | 980 | 280 | 860 | 980 | 113 | 38 | 69 | 75 | 2.51 | 1.92 | 2.75 | 3.60 |
| Early: | | | | | | | | | | | | |
| Alabama..... | 2,880 | 3,830 | 2,680 | 2,550 | 472 | 582 | 364 | 581 | .56 | .97 | 1.01 | 1.20 |
| California..... | 1,200 | 1,000 | 1,050 | 1,000 | 173 | 163 | 181 | 159 | .93 | .97 | 1.06 | 1.19 |
| Florida..... | 6,610 | 7,440 | 8,560 | 10,080 | 965 | 1,042 | 685 | 1,028 | 2.51 | 1.92 | 3.04 | 2.66 |
| Georgia..... | 720 | 720 | 720 | 709 | 67 | 90 | 45 | 62 | .85 | 1.26 | 1.18 | 1.93 |
| Louisiana..... | 3,040 | 2,760 | 2,360 | 3,000 | 316 | 317 | 189 | 408 | 1.59 | .79 | 1.25 | 1.31 |
| South Carolina..... | 4,120 | 4,300 | 5,300 | 5,140 | 490 | 636 | 398 | 586 | 1.02 | 1.37 | .71 | .97 |
| Texas..... | 3,000 | 4,150 | 5,220 | 5,680 | 357 | 415 | 360 | 636 | 1.55 | 1.05 | 1.60 | 1.86 |
| Total..... | 21,570 | 24,200 | 25,890 | 28,150 | 2,840 | 3,245 | 2,222 | 3,460 | 1.57 | 1.35 | 1.72 | 1.74 |
| Second early: | | | | | | | | | | | | |
| Arkansas..... | 1,760 | 1,760 | 1,970 | 1,480 | 150 | 176 | 177 | 152 | 1.01 | 1.51 | .63 | 1.27 |
| North Carolina..... | 4,570 | 4,340 | 4,340 | 4,200 | 530 | 704 | 573 | 525 | 1.13 | .90 | .72 | 1.76 |
| Virginia..... | 1,640 | 1,650 | 1,730 | 1,470 | 205 | 214 | 164 | 103 | 1.15 | .91 | 1.00 | 2.75 |
| Total..... | 7,970 | 7,750 | 8,040 | 7,150 | 885 | 1,154 | 914 | 780 | 1.12 | 1.00 | .75 | 1.70 |
| Intermediate: | | | | | | | | | | | | |
| Delaware..... | 1,500 | 1,120 | 1,210 | 1,150 | 255 | 202 | 157 | 132 | .56 | .90 | .40 | 1.37 |
| Illinois..... | 860 | 560 | 500 | 650 | 67 | 28 | 41 | 49 | .78 | 1.21 | .71 | 1.97 |
| Maryland..... | 2,080 | 1,700 | 1,750 | 1,780 | 260 | 292 | 315 | 303 | .56 | 1.30 | .53 | 1.38 |
| New Jersey..... | 2,100 | 2,000 | 2,040 | 2,240 | 420 | 370 | 357 | 325 | .95 | 1.25 | 1.00 | 1.45 |
| Ohio, Washington Co..... | | | 110 | 100 | | | | 6 | | | .95 | 1.00 |
| Total..... | 6,240 | 5,380 | 5,700 | 5,920 | 1,002 | 892 | 876 | 814 | .74 | 1.19 | .71 | 1.44 |
| Late: New York..... | 3,850 | 3,950 | 4,110 | 4,110 | 490 | 585 | 600 | 300 | .94 | .98 | 1.06 | 1.59 |
| Grand total..... | 40,710 | 41,500 | 44,600 | 46,310 | 5,360 | 5,914 | 4,681 | 5,429 | 1.31 | 1.22 | 1.27 | 1.72 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 239.—*Cucumbers for pickles, commercial crop: Acreage, production, and price per bushel, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Price per unit of production | | | |
|-------------------|--------------|--------------|--------------|--------------|--------------------|--------------------|--------------------|--------------------|------------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| New York..... | 929 | 680 | 800 | 820 | 32 | 35 | 44 | 28 | 0.88 | 1.27 | 0.93 | 0.93 |
| Ohio..... | 1,600 | 1,750 | 1,700 | 1,730 | 88 | 61 | 110 | 78 | .90 | 1.02 | 1.00 | 1.06 |
| Indiana..... | 7,250 | 6,800 | 9,870 | 9,480 | 392 | 258 | 572 | 332 | 1.12 | .93 | .87 | .90 |
| Illinois..... | 940 | 960 | 1,560 | 1,250 | 47 | 34 | 90 | 44 | 1.22 | 1.24 | 1.10 | 1.10 |
| Michigan..... | 25,030 | 17,350 | 22,840 | 21,000 | 1,051 | 520 | 1,256 | 630 | .98 | .90 | .88 | .90 |
| Wisconsin..... | 11,950 | 6,800 | 10,190 | 11,310 | 598 | 272 | 505 | 475 | .92 | 1.08 | .98 | 1.00 |
| Minnesota..... | 3,000 | 3,060 | 3,500 | 3,500 | 135 | 92 | 105 | 84 | .90 | .73 | .93 | .95 |
| Iowa..... | 800 | 270 | 940 | 1,300 | 34 | 12 | 62 | 62 | 1.11 | .90 | 1.03 | 1.05 |
| Missouri..... | 2,800 | 670 | 1,260 | 1,260 | 98 | 35 | 76 | 28 | .82 | 1.00 | .75 | .75 |
| Colorado..... | 2,900 | 3,130 | 2,300 | 2,400 | 177 | 156 | 232 | 276 | .87 | .75 | .60 | .60 |
| Washington..... | 530 | 410 | 460 | 510 | 32 | 28 | 44 | 77 | .90 | .82 | .75 | .75 |
| California..... | 2,560 | 2,120 | 2,760 | 2,710 | 369 | 337 | 486 | 623 | .93 | .97 | .62 | .63 |
| Other States..... | 9,460 | 7,940 | 7,240 | 7,060 | 615 | 540 | 348 | 478 | .92 | .96 | .90 | .90 |
| Total..... | 69,740 | 51,940 | 65,420 | 65,230 | 3,668 | 2,380 | 3,975 | 3,215 | .96 | .94 | .85 | .84 |

Bureau of Agricultural Economics. Estimates based upon returns from pickle packers.

TABLE 240.—*Cucumbers: Car-lot shipments, by State of origin, 1920-1929*

| State | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1926 | 1928 | 1929 ¹ |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 312 | 540 | 395 | 383 | 694 | 086 | 456 | 607 | 1,001 | 528 |
| New Jersey..... | 287 | 271 | 164 | 258 | 276 | 481 | 261 | 368 | 370 | 156 |
| Ohio..... | 52 | 118 | 124 | 68 | 111 | 91 | 187 | 203 | 191 | 119 |
| Indiana..... | 9 | 25 | 18 | 6 | 16 | 67 | 104 | 135 | 147 | 125 |
| Illinois..... | 142 | 164 | 68 | 15 | 77 | 245 | 150 | 101 | 148 | 117 |
| Delaware..... | 256 | 137 | 191 | 225 | 240 | 302 | 304 | 308 | 214 | 163 |
| Maryland..... | 297 | 343 | 368 | 446 | 311 | 598 | 479 | 692 | 563 | 469 |
| Virginia..... | 83 | 19 | 221 | 84 | 387 | 448 | 200 | 339 | 229 | 179 |
| North Carolina..... | 408 | 641 | 087 | 1,175 | 1,639 | 1,562 | 869 | 935 | 812 | 651 |
| South Carolina..... | 525 | 664 | 887 | 720 | 918 | 704 | 687 | 916 | 663 | 1,043 |
| Florida..... | 835 | 1,414 | 2,034 | 1,647 | 1,381 | 1,963 | 2,048 | 2,300 | 1,672 | 2,298 |
| Alabama..... | 259 | 109 | 702 | 367 | 576 | 706 | 684 | 583 | 606 | 795 |
| Texas..... | 95 | 64 | 119 | 46 | 147 | 72 | 316 | 178 | 382 | 294 |
| Arkansas..... | 26 | 62 | 8 | 24 | 93 | 145 | 234 | 228 | 328 | 195 |
| Other States..... | 103 | 261 | 363 | 236 | 316 | 342 | 203 | 229 | 242 | 354 |
| Total..... | 3,689 | 4,832 | 6,349 | 5,700 | 7,182 | 8,492 | 7,272 | 8,180 | 7,468 | 7,456 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Preliminary.TABLE 241.—*Eggplant, commercial crop: Acreage, production, and price per bushel, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per bushel | | | |
|-------------------------------|--------------|--------------|--------------|--------------|--------------------|--------------------|--------------------|--------------------|--------------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| Fall: | | | | | | | | | | | | |
| Florida..... | 490 | 150 | 620 | 660 | 180 | 46 | 186 | 132 | 1.35 | 1.61 | 0.91 | 2.00 |
| Texas..... | 180 | 370 | 300 | 250 | 41 | 111 | 90 | 10 | 1.00 | .45 | .59 | 1.60 |
| Total..... | 670 | 520 | 920 | 910 | 221 | 157 | 226 | 142 | 1.29 | .79 | .78 | 1.97 |
| Early: Florida..... | 530 | 580 | 930 | 620 | 212 | 188 | 236 | 188 | 1.33 | 1.21 | .91 | 1.34 |
| Second early: Louisiana..... | 1,060 | 890 | 830 | 800 | 138 | 139 | 132 | 123 | 1.05 | 1.00 | .90 | 1.30 |
| Intermediate: New Jersey..... | 1,000 | 1,100 | 1,210 | 1,300 | 220 | 330 | 302 | 260 | 1.00 | .80 | .88 | .75 |
| Grand total..... | 3,260 | 3,090 | 3,890 | 3,630 | 791 | 814 | 896 | 713 | 1.18 | .93 | .87 | 1.24 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

STATISTICS OF FRUITS AND VEGETABLES

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TABLE 242.—Lettuce, commercial crop: Acreage, production, and price per crate, by States, 1926-1929

| State | Acreage | | | | Production | | | | Seasonal farm price per crate | | | |
|----------------------------|--------------|--------------|--------------|--------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|-------------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| Early: | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 crates</i> ¹ | <i>1,000 crates</i> ¹ | <i>1,000 crates</i> ¹ | <i>1,000 crates</i> ¹ | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| Arizona..... | 6,500 | 7,000 | 12,700 | 10,500 | 1,462 | 1,281 | 1,664 | 1,766 | 1.85 | 0.97 | 0.98 | 1.60 |
| California (Imperial)..... | 28,000 | 34,400 | 22,000 | 27,250 | 4,900 | 5,229 | 3,740 | 4,006 | 1.95 | 1.34 | 1.62 | 2.09 |
| Florida..... | 1,500 | 1,840 | 1,850 | 1,970 | 252 | 204 | 314 | 362 | 2.21 | 1.62 | 1.61 | 1.29 |
| Texas..... | 640 | 950 | 1,000 | 1,100 | 72 | 103 | 100 | 220 | 1.19 | 1.00 | 1.02 | 1.00 |
| Total..... | 36,640 | 44,190 | 37,550 | 46,820 | 6,686 | 6,907 | 5,818 | 6,354 | 1.93 | .96 | 1.43 | 1.87 |
| Second early: | | | | | | | | | | | | |
| Arizona..... | 2,000 | 7,800 | 13,500 | 11,000 | 450 | 1,755 | 1,418 | 1,727 | 2.05 | 1.63 | 1.88 | 2.85 |
| California (other)..... | 17,800 | 16,530 | 24,500 | 26,150 | 3,204 | 2,314 | 3,479 | 2,693 | 1.28 | .96 | 1.39 | 1.86 |
| North Carolina..... | 1,420 | 1,490 | 1,490 | 1,160 | 379 | 207 | 238 | 197 | 2.00 | 1.87 | 1.60 | 1.65 |
| South Carolina..... | 780 | 700 | 750 | 680 | 133 | 158 | 112 | 102 | 1.81 | 1.59 | 2.11 | 1.83 |
| Total..... | 22,000 | 26,520 | 40,240 | 38,990 | 4,166 | 4,434 | 5,247 | 4,719 | 1.45 | 1.29 | 1.55 | 2.21 |
| Intermediate: | | | | | | | | | | | | |
| Idaho..... | 200 | 120 | 40 | 50 | 25 | 18 | 4 | 8 | 1.47 | 1.22 | 1.67 | 2.25 |
| New Jersey..... | 1,100 | 1,200 | 1,300 | 1,170 | 275 | 300 | 292 | 234 | 1.00 | 2.34 | 1.70 | 1.76 |
| New Mexico..... | 30 | 20 | 200 | ----- | 2 | 2 | 16 | ----- | 1.66 | .75 | 1.25 | ----- |
| Oregon..... | 260 | 200 | 50 | 70 | 13 | 10 | 7 | 6 | 1.42 | 1.25 | 1.25 | 1.30 |
| Virginia..... | 300 | 300 | 300 | 280 | 38 | 50 | 60 | 57 | 1.70 | 1.50 | 1.45 | 1.00 |
| Washington..... | 1,510 | 1,940 | 1,760 | 2,390 | 317 | 388 | 370 | 514 | 1.30 | 1.49 | 1.00 | 1.27 |
| Total..... | 3,400 | 3,780 | 3,650 | 3,960 | 670 | 768 | 749 | 819 | 1.20 | 1.81 | 1.32 | 1.40 |
| Late: | | | | | | | | | | | | |
| California (other)..... | ----- | 5,260 | 7,800 | 9,630 | ----- | 773 | 975 | 1,194 | ----- | .97 | 2.16 | 2.12 |
| Colorado..... | 13,240 | 13,240 | 9,800 | 9,800 | 1,523 | 1,456 | 1,127 | 1,078 | 1.43 | 1.63 | 1.07 | 1.25 |
| New Mexico..... | 950 | 340 | 200 | 200 | 71 | 49 | 13 | 20 | 1.66 | .75 | 1.50 | 1.30 |
| New York..... | 7,200 | 5,540 | 4,460 | 5,800 | 1,246 | 1,457 | 1,004 | 1,740 | 1.60 | 1.48 | 2.68 | 1.13 |
| Pennsylvania..... | 80 | 80 | 80 | 80 | 12 | 10 | 9 | 12 | 1.24 | 1.50 | 2.70 | 1.20 |
| Total..... | 21,470 | 24,460 | 22,340 | 25,510 | 2,852 | 3,745 | 3,128 | 4,044 | 1.51 | 1.42 | 1.93 | 1.46 |
| Late (Fall): | | | | | | | | | | | | |
| California (other)..... | 19,300 | 21,350 | 19,120 | 24,500 | 2,355 | 2,946 | 3,174 | 4,067 | 1.56 | .77 | 2.24 | 1.74 |
| Idaho..... | 1,000 | 1,000 | 260 | 260 | 132 | 200 | 38 | 38 | 1.26 | .85 | 1.67 | .75 |
| New Jersey..... | 1,300 | 1,250 | 1,000 | 950 | 228 | 312 | 150 | 204 | 1.20 | 1.76 | 2.20 | 2.20 |
| New Mexico..... | 50 | 50 | 30 | ----- | 4 | 8 | 1 | ----- | 1.66 | .75 | 1.65 | ----- |
| Oregon..... | 100 | 100 | 50 | 50 | 5 | 5 | 4 | 5 | 1.75 | 1.25 | 1.25 | 1.30 |
| Washington..... | 90 | 110 | 350 | 350 | 19 | 22 | 70 | 72 | 1.30 | 1.48 | 1.25 | 1.50 |
| Wyoming..... | 210 | 200 | 40 | 40 | 27 | 22 | 3 | 3 | 1.40 | 1.20 | 1.82 | 1.30 |
| Total..... | 22,050 | 24,060 | 20,850 | 26,150 | 2,770 | 3,515 | 3,440 | 4,380 | 1.51 | .87 | 2.21 | 1.75 |
| Grand total..... | 105,560 | 123,010 | 124,630 | 141,430 | 17,144 | 19,369 | 18,382 | 20,325 | 1.65 | 1.13 | 1.69 | 1.82 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

¹ Western crate normally containing 4 dozen heads; other crates reduced to this equivalent.**TABLE 243.—Lettuce: Car-lot shipments, by State of origin, 1920-1929**

| State | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ¹ |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 1,775 | 3,240 | 3,167 | 3,817 | 3,698 | 3,821 | 3,019 | 3,496 | 3,140 | 3,704 |
| New Jersey..... | 208 | 469 | 571 | 456 | 417 | 463 | 303 | 308 | 144 | 166 |
| North Carolina..... | 207 | 445 | 622 | 718 | 714 | 537 | 540 | 447 | 477 | 362 |
| South Carolina..... | 121 | 716 | 987 | 577 | 423 | 736 | 372 | 369 | 241 | 310 |
| Florida..... | 2,940 | 2,267 | 3,323 | 3,146 | 2,257 | 1,519 | 987 | 929 | 819 | 910 |
| Idaho..... | 25 | 180 | 889 | 1,241 | 532 | 501 | 398 | 196 | 72 | 76 |
| Colorado..... | 129 | 234 | 812 | 1,436 | 1,036 | 3,096 | 2,795 | 2,848 | 2,368 | 2,098 |
| Arizona..... | 254 | 168 | 678 | 1,108 | 2,049 | 3,519 | 4,906 | 9,131 | 9,228 | 7,853 |
| Washington..... | 354 | 635 | 812 | 1,081 | 674 | 820 | 904 | 1,151 | 1,240 | 1,787 |
| California..... | 7,358 | 9,850 | 9,744 | 15,113 | 18,480 | 21,618 | 27,443 | 27,574 | 33,457 | 35,671 |
| Other States..... | 417 | 534 | 635 | 792 | 655 | 676 | 540 | 401 | 318 | 277 |
| Total..... | 13,788 | 18,738 | 22,240 | 29,485 | 30,935 | 37,306 | 42,207 | 46,850 | 51,504 | 53,164 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Preliminary.

TABLE 244.—Onions, commercial crop: Acreage, production, and price per bushel, by States, 1926-1929

| State | Acreage | | | | Production | | | | Seasonal farm price per bushel | | | |
|-----------------------------------|--------------|--------------|--------------|--------------|--------------------|--------------------|--------------------|--------------------|--------------------------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| Early (Bermuda, Creole): | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>1,000 bush.</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| California..... | 2,850 | 3,950 | 3,950 | 3,450 | 926 | 1,114 | 980 | 869 | 1.39 | 1.80 | 0.77 | 1.25 |
| Louisiana..... | 2,750 | 2,900 | 2,310 | 2,180 | 352 | 316 | 293 | 277 | 1.17 | 1.22 | .89 | 1.09 |
| Texas..... | 12,510 | 11,220 | 18,280 | 10,700 | 2,552 | 2,199 | 3,546 | 3,763 | 1.36 | 1.09 | 1.10 | 1.02 |
| Total..... | 18,110 | 18,070 | 24,540 | 25,330 | 3,830 | 3,633 | 4,819 | 4,909 | 1.35 | 1.08 | 1.02 | 1.06 |
| Intermediate (domestic): | | | | | | | | | | | | |
| California..... | 320 | 550 | 780 | 840 | 143 | 228 | 299 | 373 | .60 | .74 | .75 | .45 |
| Iowa (Scott Co. Dist.).. | 780 | 800 | 1,000 | 1,000 | 246 | 200 | 288 | 375 | .94 | 1.35 | .88 | .86 |
| Kentucky..... | 1,000 | 800 | 800 | 600 | 250 | 110 | 320 | 48 | .50 | 1.00 | .45 | .43 |
| New Jersey..... | 2,900 | 2,900 | 3,000 | 2,550 | 580 | 696 | 780 | 650 | 1.00 | 1.25 | 1.00 | 1.35 |
| Texas (Collin Co. Dist.) | 1,500 | 1,050 | 2,000 | 660 | 262 | 131 | 780 | 170 | .84 | 1.89 | .56 | 1.27 |
| Virginia..... | 900 | 600 | 400 | 250 | 90 | 89 | 64 | 62 | .76 | .75 | .51 | 1.15 |
| Washington (Walla Walla Co.)..... | 1,000 | 1,000 | 1,000 | 1,030 | 400 | 418 | 415 | 525 | .68 | .63 | .40 | .63 |
| Total..... | 8,400 | 7,700 | 8,980 | 6,930 | 1,971 | 1,878 | 2,926 | 2,203 | .80 | 1.07 | .69 | .91 |
| Late (domestic): | | | | | | | | | | | | |
| California..... | 7,260 | 5,170 | 5,160 | 5,750 | 2,076 | 1,872 | 1,533 | 1,587 | .65 | .70 | 1.28 | .85 |
| Colorado..... | 3,700 | 4,300 | 3,760 | 7,000 | 1,018 | 1,376 | 1,241 | 2,583 | .50 | .45 | 1.42 | .45 |
| Idaho..... | 950 | 1,900 | 1,000 | 1,100 | 276 | 902 | 700 | 522 | .48 | .47 | 1.14 | .50 |
| Illinois..... | 670 | 670 | 740 | 770 | 168 | 201 | 169 | 192 | .98 | .87 | 1.22 | .70 |
| Indiana..... | 8,140 | 8,100 | 8,510 | 8,400 | 2,726 | 2,738 | 2,042 | 2,436 | .56 | .59 | 1.60 | .56 |
| Iowa (other)..... | 1,600 | 1,470 | 1,280 | 1,420 | 480 | 400 | 421 | 469 | .66 | .67 | 1.15 | .40 |
| Massachusetts..... | 4,420 | 4,550 | 3,500 | 2,730 | 1,746 | 1,342 | 840 | 1,051 | .62 | .74 | 1.01 | .85 |
| Michigan..... | 3,370 | 3,200 | 4,520 | 5,000 | 1,284 | 1,360 | 1,243 | 1,780 | .63 | .54 | 1.40 | .62 |
| Minnesota..... | 1,870 | 2,180 | 1,740 | 2,160 | 527 | 691 | 632 | 756 | .54 | .51 | 1.28 | .60 |
| New York..... | 7,580 | 8,530 | 5,830 | 7,810 | 2,729 | 3,352 | 1,283 | 3,577 | .67 | .59 | 1.35 | .75 |
| Ohio..... | 5,300 | 7,000 | 6,550 | 7,860 | 1,367 | 2,352 | 891 | 2,138 | .65 | .60 | 1.60 | .55 |
| Oregon..... | 1,130 | 1,200 | 950 | 1,040 | 358 | 420 | 361 | 406 | .51 | .58 | 1.43 | .69 |
| Pennsylvania..... | 180 | 180 | 150 | 140 | 50 | 54 | 37 | 43 | .95 | .75 | 1.10 | .71 |
| Utah..... | 800 | 900 | 1,000 | 1,100 | 360 | 360 | 520 | 475 | .60 | .50 | 1.20 | .60 |
| Washington (other).... | 800 | 860 | 710 | 820 | 260 | 359 | 411 | 377 | .38 | .57 | 1.12 | .53 |
| Wisconsin..... | 1,200 | 1,600 | 1,100 | 1,210 | 348 | 507 | 385 | 363 | .51 | .58 | 1.25 | .69 |
| Total..... | 49,270 | 51,810 | 46,500 | 54,310 | 15,773 | 18,286 | 12,709 | 18,755 | .60 | .58 | 1.35 | .73 |
| Total domestic..... | 57,670 | 59,510 | 55,480 | 61,240 | 17,744 | 20,164 | 15,635 | 20,958 | .63 | .63 | 1.23 | .66 |
| Grand total..... | 75,780 | 77,580 | 80,020 | 86,570 | 21,574 | 23,797 | 20,462 | 25,867 | .73 | .79 | 1.18 | .74 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 245.—Onions: Car-lot shipments, by State of origin, 1920-1928

| State | Crop-movement season ¹ | | | | | | | | |
|--------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 ² |
| Massachusetts..... | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 3,914 | 2,244 | 1,912 | 2,454 | 2,481 | 2,856 | 3,586 | 2,495 | 1,416 |
| New Jersey..... | 3,381 | 2,890 | 2,812 | 5,505 | 5,335 | 5,109 | 3,720 | 4,101 | 1,807 |
| Ohio..... | 371 | 429 | 479 | 355 | 403 | 235 | 285 | 295 | 233 |
| Illinois..... | 3,239 | 1,749 | 4,493 | 2,714 | 4,492 | 1,856 | 2,287 | 4,070 | 1,771 |
| Indiana..... | 4,124 | 1,972 | 4,084 | 4,610 | 3,735 | 4,158 | 4,486 | 5,000 | 3,940 |
| Michigan..... | 409 | 251 | 487 | 378 | 241 | 291 | 158 | 142 | 180 |
| Wisconsin..... | 939 | 417 | 1,807 | 1,222 | 1,623 | 1,402 | 2,171 | 2,653 | 2,062 |
| Minnesota..... | 409 | 90 | 330 | 273 | 212 | 361 | 270 | 279 | 292 |
| Iowa..... | 287 | 169 | 500 | 189 | 487 | 674 | 684 | 1,289 | 1,077 |
| Virginia..... | 830 | 416 | 827 | 882 | 1,176 | 1,365 | 1,434 | 1,333 | 1,430 |
| Kentucky..... | 189 | 280 | 371 | 274 | 345 | 138 | 178 | 151 | 178 |
| Texas..... | 304 | 382 | 258 | 263 | 266 | 152 | 134 | 145 | 69 |
| Idaho..... | 4,957 | 4,209 | 4,630 | 3,027 | 3,918 | 3,941 | 5,816 | 4,028 | 7,061 |
| Colorado..... | 28 | 50 | 161 | 256 | 322 | 876 | 531 | 891 | 1,152 |
| Utah..... | 150 | 447 | 651 | 928 | 1,064 | 1,809 | 1,758 | 1,460 | 2,244 |
| Washington..... | 9 | 54 | 170 | 177 | 216 | 599 | 662 | 664 | 1,026 |
| Oregon..... | 810 | 702 | 765 | 1,126 | 1,016 | 1,000 | 1,200 | 1,802 | 1,153 |
| California..... | 27 | 843 | 283 | 392 | 558 | 681 | 678 | 671 | 663 |
| Other States..... | 4,802 | 3,642 | 3,631 | 4,145 | 2,671 | 3,608 | 3,013 | 3,758 | 4,492 |
| Total..... | 840 | 254 | 369 | 330 | 285 | 540 | 536 | 499 | 551 |
| Total..... | 29,472 | 20,890 | 29,760 | 29,480 | 30,706 | 31,646 | 33,062 | 35,191 | 33,320 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop movement season extends from March 1 of one year through June of the following year.² Preliminary.

TABLE 246.—Onions: United States imports, by countries, annual, 1920-1929

| Year ended June 30 | Neth- er- lands | Spain | Italy | United King- dom | Can- ada | Ca- nary Is- lands | Ber- mu- da | Mex- ico | Chile | Aus- tra- lia | Egypt | Other coun- tries | Total |
|-----------------------|-----------------------|----------------|----------------|------------------------|----------------|-----------------------------|-------------------|----------------|----------------|---------------------|----------------|-------------------------|----------------|
| | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. |
| 1920..... | 0 | 1,497 | 19 | 48 | 4 | 25 | 66 | 1 | 0 | 23 | 194 | 7 | 1,884 |
| 1921..... | 2 | 575 | 8 | 43 | 8 | 14 | 28 | (1) | 0 | 3 | 6 | 2 | 689 |
| 1922..... | 40 | 1,522 | 74 | 247 | 66 | 18 | 34 | 26 | 43 | 119 | 243 | 56 | 2,488 |
| 1923..... | 33 | 990 | 11 | 157 | 42 | 13 | 18 | 20 | 1 | 3 | 447 | 48 | 1,783 |
| 1924..... | (1) | 1,098 | 17 | 52 | 1 | 8 | 9 | 29 | 30 | 4 | 148 | 10 | 1,406 |
| 1925..... | 60 | 1,090 | 19 | 71 | 29 | 7 | 9 | 18 | 79 | 8 | 618 | 67 | 2,075 |
| 1926..... | 11 | 1,342 | 100 | 36 | 11 | 4 | 9 | 20 | 26 | 3 | 590 | 33 | 2,194 |
| 1927..... | 48 | 1,084 | 65 | 50 | 9 | 2 | 9 | 1 | 76 | 8 | 912 | 25 | 2,298 |
| 1928..... | 11 | 701 | 35 | 12 | 2 | 1 | 3 | (1) | 213 | 3 | 392 | 26 | 1,399 |
| 1929..... | 580 | 1,007 | 145 | 26 | 4 | 2 | (1) | 11 | 134 | 4 | 105 | 32 | 2,950 |

Bureau of Agricultural Economics. Compiled from official records of the Bureau of Foreign and Domestic Commerce, Department of Commerce.

¹ Less than 500 bushels.

TABLE 247.—Onions: Average l. c. l. price per 100 pounds to jobbers, at New York and Chicago, 1919-1929

| Market, and season beginning August | Various common varieties | | | | | | | | Bermudas | | | | | |
|--|--------------------------|--------|--------|--------|--------|--------|--------|--------|-------------|------------------------------|------------------|------------------------------|-------------------|------------------------------|
| | Aug. ¹ | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | April | | May ² | | June ² | |
| | | | | | | | | | Yel- low | Crys- tal white wax | Yel- low | Crys- tal white wax | Yel- low | Crys- tal white wax |
| | | | | | | | | | | | | | | |
| New York: | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1919..... | 3.32 | 3.39 | 3.46 | 4.42 | 5.70 | 6.24 | 5.69 | 5.92 | ----- | ----- | 5.92 | 5.56 | 2.53 | 2.25 |
| 1920..... | 2.53 | 2.24 | 1.56 | 1.55 | 1.23 | 1.31 | 1.98 | .80 | 4.34 | 3.46 | 3.15 | 3.79 | 2.93 | 3.01 |
| 1921..... | 2.80 | 3.43 | 5.06 | 5.63 | 5.45 | 7.34 | 8.25 | 8.21 | 7.66 | 6.20 | 4.14 | 3.79 | 3.91 | 3.54 |
| 1922..... | 2.08 | 1.52 | 1.72 | 2.00 | 2.99 | 2.83 | 2.45 | 2.98 | ----- | ----- | 5.31 | 5.19 | ----- | ----- |
| 1923..... | 2.68 | 3.21 | 3.26 | 2.75 | 2.76 | 2.73 | 2.33 | 2.20 | ----- | ----- | 3.27 | ----- | ----- | ----- |
| 1924..... | 2.17 | 1.89 | 1.84 | 2.08 | 2.84 | 3.05 | 3.05 | 2.86 | 4.19 | 5.04 | 6.16 | 5.01 | 7.18 | ----- |
| 1925..... | 2.94 | 2.36 | 2.86 | 2.80 | 3.26 | 2.95 | 2.69 | 2.81 | ----- | ----- | 4.37 | ----- | 3.27 | ----- |
| 1926..... | 2.26 | 1.59 | 1.82 | 1.92 | 2.74 | 3.08 | 2.76 | 3.46 | 5.30 | ----- | 5.64 | ----- | 6.64 | ----- |
| 1927..... | 2.17 | 1.72 | 1.60 | 1.72 | 2.18 | 2.60 | 2.89 | 4.25 | 5.38 | 6.17 | 3.14 | 3.33 | 2.37 | 2.00 |
| 1928..... | 2.62 | 3.53 | 3.62 | 4.14 | 4.42 | 4.88 | 5.42 | 4.67 | 4.47 | ----- | 3.10 | ----- | 3.50 | ----- |
| 1929..... | 2.31 | 2.02 | 1.91 | 1.86 | 2.28 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Chicago: | | | | | | | | | | | | | | |
| 1919..... | 3.45 | 3.42 | 3.91 | 4.59 | 5.18 | 5.56 | 5.03 | 5.75 | 9.03 | ----- | 4.59 | 5.08 | 2.83 | 2.41 |
| 1920..... | 2.06 | 1.94 | 1.59 | 1.56 | 1.31 | 1.16 | .98 | .93 | 3.48 | 4.37 | 2.79 | 3.73 | 2.53 | 3.27 |
| 1921..... | 2.58 | 3.61 | 4.47 | 5.11 | 5.62 | 7.09 | 7.04 | 8.53 | 6.21 | 6.47 | 4.05 | 4.20 | 3.43 | 3.89 |
| 1922..... | 2.12 | 1.61 | 1.70 | 2.22 | 2.29 | 2.56 | 3.44 | 3.38 | 5.96 | ----- | 5.15 | 5.79 | ----- | ----- |
| 1923..... | 3.19 | 3.48 | 3.29 | 3.22 | 3.07 | 3.27 | 3.04 | 2.79 | 5.17 | ----- | 3.37 | 4.10 | ----- | ----- |
| 1924..... | 3.11 | 2.73 | 2.43 | 2.52 | 2.88 | 3.96 | 4.38 | 4.32 | 4.15 | 5.46 | 6.33 | 6.75 | 7.94 | 8.39 |
| 1925..... | 3.41 | 2.90 | 3.11 | 3.35 | 3.46 | 3.20 | 2.81 | 3.18 | 5.60 | 5.92 | 3.97 | 4.71 | 3.21 | 3.61 |
| 1926..... | 2.25 | 2.07 | 1.92 | 1.69 | 2.46 | 3.31 | 3.42 | 3.92 | 6.27 | 5.96 | 5.66 | 6.15 | 5.57 | 6.07 |
| 1927..... | 2.57 | 1.74 | 1.68 | 1.65 | 2.02 | 2.77 | 2.78 | 4.04 | 4.57 | 5.23 | 3.04 | 3.17 | 2.31 | 2.64 |
| 1928..... | 2.72 | 3.35 | 3.66 | 4.22 | 4.59 | 5.27 | 5.39 | 5.20 | 4.07 | 5.22 | 3.06 | 3.33 | 3.45 | 4.42 |
| 1929..... | 3.08 | 2.44 | 2.12 | 2.20 | 2.29 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

Average prices as shown are based on stock of U. S. No. 1 grade; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units or vice versa, in order to obtain comparability.

¹ Quotations began Aug. 23, 1920; Aug. 22, 1921; Aug. 7, 1922; Aug. 22, 1924; July 22, 1925.

² Last reported quotations of season June 30, 1920; June 11, 1921; June 14, 1922; May 29, 1923; June 4, 1924; June 10, 1925; for subsequent years onion reports have run through the entire year.

TABLE 248.—*Peas, green, for consumption fresh; commercial crop: Acreage, production, and price per bushel, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per bushel | | | |
|----------------------------|--------------|--------------|--------------|--------------|----------------------|----------------------|----------------------|----------------------|--------------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| Early: | | | | | | | | | | | | |
| Arizona..... | 400 | 500 | 500 | 600 | 11 | 25 | 50 | 36 | 1.56 | 1.33 | 2.00 | 1.68 |
| California (Imperial)..... | 1,000 | 1,700 | 3,000 | 4,400 | 100 | 85 | 240 | 242 | 2.36 | 2.20 | 3.00 | 2.52 |
| Florida..... | 760 | 700 | 1,230 | 1,320 | 40 | 34 | 68 | 59 | 2.67 | 3.50 | 2.50 | 2.80 |
| Total..... | 2,160 | 2,900 | 4,730 | 6,320 | 151 | 144 | 358 | 337 | 2.38 | 2.35 | 2.76 | 2.48 |
| Second Early: | | | | | | | | | | | | |
| California (other)..... | 9,650 | 16,300 | 13,560 | 14,350 | 482 | 1,744 | 1,451 | 1,622 | 3.60 | 2.00 | 1.75 | 1.08 |
| Louisiana..... | 760 | 1,600 | 1,330 | 1,430 | 37 | 78 | 77 | 79 | 1.94 | 1.67 | 1.68 | 2.38 |
| Mississippi..... | 2,050 | 2,250 | 2,200 | 2,310 | 195 | 169 | 156 | 171 | 1.81 | 1.58 | 1.78 | 1.38 |
| South Carolina..... | 1,700 | 2,200 | 3,100 | 2,880 | 95 | 99 | 183 | 181 | 1.26 | 1.09 | 1.50 | 1.64 |
| Total..... | 14,160 | 22,350 | 20,190 | 20,970 | 809 | 2,090 | 1,867 | 2,053 | 2.82 | 1.91 | 1.72 | 1.68 |
| Intermediate: | | | | | | | | | | | | |
| Delaware..... | 60 | 80 | 80 | 100 | 4 | 7 | 6 | 7 | 2.25 | 2.00 | 1.75 | 1.00 |
| Maryland..... | 450 | 450 | 800 | 820 | 27 | 35 | 51 | 62 | 1.19 | 1.32 | 1.12 | 1.25 |
| New Jersey..... | 3,800 | 4,000 | 3,000 | 3,000 | 323 | 360 | 240 | 240 | 2.20 | 2.13 | 1.40 | 1.30 |
| North Carolina..... | 3,880 | 3,960 | 4,390 | 3,100 | 213 | 277 | 351 | 217 | 1.32 | 1.92 | .82 | 1.61 |
| Tennessee..... | 500 | 500 | 500 | 350 | 25 | 28 | 35 | 21 | 1.87 | 2.17 | 1.00 | 1.25 |
| Utah..... | 200 | 200 | 600 | 600 | 30 | 16 | 67 | 68 | 1.95 | 2.40 | 1.50 | 1.50 |
| Virginia..... | 2,440 | 3,000 | 3,000 | 2,000 | 117 | 291 | 273 | 166 | .93 | 1.57 | 1.02 | 2.35 |
| Total..... | 11,330 | 12,190 | 12,370 | 9,970 | 739 | 1,014 | 1,023 | 781 | 1.69 | 1.89 | 1.08 | 1.62 |
| Late: | | | | | | | | | | | | |
| California— | | | | | | | | | | | | |
| Imperial..... | 3,000 | 4,000 | 6,000 | 8,500 | 300 | 280 | 300 | 425 | 2.36 | 2.10 | 1.75 | 2.24 |
| Other..... | 2,300 | 4,810 | 3,250 | 4,280 | 115 | 390 | 481 | 437 | 3.52 | 1.90 | 2.93 | 1.82 |
| Colorado..... | 1,940 | 4,000 | 6,500 | 9,500 | 120 | 200 | 358 | 770 | 1.94 | 2.84 | 1.60 | 1.30 |
| New York..... | 8,070 | 6,940 | 7,500 | 7,580 | 646 | 923 | 660 | 606 | 1.33 | 1.86 | 1.30 | 2.33 |
| Oregon..... | | | 100 | 200 | | | 12 | 25 | | | 1.55 | 1.60 |
| Total..... | 15,310 | 19,750 | 23,350 | 30,060 | 1,181 | 1,793 | 1,811 | 2,263 | 1.87 | 2.02 | 1.87 | 1.86 |
| Grand total..... | 42,960 | 57,190 | 60,640 | 67,320 | 2,880 | 5,041 | 5,059 | 5,434 | 2.12 | 1.96 | 1.72 | 1.79 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 249.—*Peas, green, for canning; commercial crop: Acreage, production, and price per pound, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Price per pound | | | |
|-------------------|--------------|--------------|--------------|--------------|---------------------|---------------------|---------------------|---------------------|-----------------|-------------|-------------|-------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| Maine..... | 1,410 | 720 | 1,100 | 1,130 | 1,128 | 1,152 | 1,980 | 2,041 | 3.5 | 3.5 | 3.5 | 3.5 |
| New York..... | 34,990 | 25,540 | 32,200 | 38,810 | 62,982 | 40,864 | 48,815 | 40,572 | 3.0 | 3.0 | 3.0 | 3.0 |
| New Jersey..... | 350 | 500 | 850 | 400 | 700 | 1,200 | 770 | 800 | 3.0 | 3.2 | 4.0 | 3.8 |
| Pennsylvania..... | 1,400 | 1,320 | 1,680 | 1,730 | 2,520 | 3,696 | 3,063 | 4,325 | 2.9 | 2.9 | 3.0 | 3.0 |
| Ohio..... | 4,210 | 2,990 | 4,020 | 4,380 | 5,894 | 4,784 | 6,030 | 6,570 | 3.2 | 3.1 | 2.7 | 2.2 |
| Indiana..... | 6,000 | 1,880 | 5,290 | 5,770 | 10,800 | 3,008 | 9,797 | 9,809 | 2.6 | 2.9 | 2.0 | 2.6 |
| Illinois..... | 9,200 | 8,830 | 8,740 | 11,010 | 16,560 | 12,362 | 15,356 | 18,056 | 3.2 | 3.0 | 2.0 | 2.5 |
| Michigan..... | 14,430 | 8,400 | 8,500 | 9,010 | 23,088 | 11,760 | 13,294 | 11,713 | 2.5 | 2.8 | 2.0 | 2.4 |
| Wisconsin..... | 108,120 | 80,000 | 101,000 | 111,000 | 233,464 | 160,000 | 203,616 | 205,350 | 2.9 | 2.8 | 3.0 | 3.0 |
| Minnesota..... | 8,570 | 6,980 | 7,920 | 12,670 | 6,856 | 11,168 | 16,347 | 21,184 | 2.7 | 2.2 | 2.0 | 2.7 |
| Delaware..... | 2,000 | 1,700 | 2,060 | 2,530 | 2,000 | 5,100 | 3,529 | 5,445 | 3.8 | 3.0 | 3.0 | 3.0 |
| Maryland..... | 8,800 | 8,000 | 10,500 | 10,800 | 17,600 | 22,400 | 20,475 | 24,840 | 3.0 | 3.0 | 3.0 | 3.0 |
| Tennessee..... | (1) | (1) | 1,400 | 1,400 | (1) | (1) | 2,520 | 2,520 | (1) | (1) | 3.0 | 3.0 |
| Montana..... | (1) | (1) | 3,500 | 4,200 | (1) | (1) | 7,560 | 7,812 | (1) | (1) | 2.5 | 2.5 |
| Colorado..... | 2,570 | 1,900 | 3,000 | 3,600 | 4,626 | 3,420 | 5,700 | 6,394 | 3.0 | 3.0 | 2.5 | 2.2 |
| Utah..... | 9,510 | 8,460 | 10,150 | 11,670 | 24,726 | 20,304 | 26,035 | 26,318 | 2.9 | 2.7 | 3.0 | 2.8 |
| California..... | 2,680 | 750 | 1,100 | 880 | 6,432 | 2,100 | 2,420 | 799 | 3.2 | 3.0 | 2.8 | 3.0 |
| Other States..... | 6,640 | 5,840 | 3,450 | 3,600 | 10,624 | 14,016 | 6,072 | 6,650 | 2.8 | 2.4 | 3.0 | 3.0 |
| Total..... | 218,880 | 163,810 | 205,960 | 229,490 | 430,000 | 317,334 | 393,379 | 401,196 | 2.9 | 2.8 | 2.8 | 2.9 |

Bureau of Agricultural Economics. Estimates based upon returns from canning establishments.

1 Included in Other States prior to 1928.

TABLE 250.—*Peas: Car-lot shipments by State of origin, 1925-1929*

| State | Crop movement season ¹ | | | | |
|---------------------------------|-----------------------------------|-------|-------|-------|-------------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 ² |
| | Cars | Cars | Cars | Cars | Cars |
| New York..... | 885 | 1,110 | 975 | 837 | 731 |
| New Jersey..... | 20 | 27 | 40 | 38 | 26 |
| Maryland..... | 48 | 55 | 54 | 68 | 52 |
| Virginia..... | 303 | 288 | 259 | 281 | 224 |
| North Carolina..... | 491 | 596 | 570 | 685 | 368 |
| South Carolina..... | 104 | 167 | 207 | 247 | 244 |
| Mississippi..... | 149 | 233 | 243 | 250 | 199 |
| Idaho..... | 13 | 40 | 101 | 176 | 238 |
| Colorado..... | 35 | 58 | 149 | 348 | 427 |
| Washington..... | 43 | 64 | 111 | 152 | 335 |
| California ³ | 223 | 859 | 1,328 | 1,529 | 2,174 |
| Other States ⁴ | 42 | 125 | 109 | 77 | 108 |
| Total..... | 2,350 | 3,622 | 4,146 | 4,688 | 5,128 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop movement season is for calendar year except for Imperial Valley California, Florida, and Texas which begins in October of the preceding year.

² Preliminary.

³ Figures for certain States include shipments in preceding year as follows: California, 1926, 4 cars in October, 220 in November, and 94 in December; 1927, 1 car in October, 223 in November, and 38 in December; 1928, 202 cars in November and 92 in December; 1929, 259 cars in November and 148 in December. Florida, 1927, 2 cars in December; 1928, 5 cars in November and 4 in December; 1929, 1 car in December. Texas, 1927, 1 car in December; 1928, 1 car in November.

TABLE 251.—*Peas, canned: Pack ¹ in the United States, 1917-1929*

| State | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases |
| New York..... | 1,394 | 2,000 | 1,040 | 2,381 | 1,382 | 2,137 | 2,541 | 2,931 | 2,385 | 2,624 | 1,668 | 2,222 | 1,683 |
| New Jersey ² | 755 | 332 | 248 | 519 | 345 | 153 | 199 | 331 | 257 | 143 | 267 | 242 | 383 |
| Ohio..... | 322 | 442 | 306 | 282 | 241 | 225 | 384 | 430 | 232 | 278 | 205 | 336 | 337 |
| Indiana..... | 604 | 454 | 381 | 271 | 182 | 208 | 367 | 483 | 86 | 500 | 90 | 427 | 389 |
| Illinois..... | 576 | 978 | 433 | 460 | 331 | 516 | 586 | 697 | 357 | 680 | 563 | 617 | 767 |
| Michigan..... | 523 | 477 | 425 | 549 | 317 | 455 | 392 | 710 | 451 | 723 | 399 | 542 | 558 |
| Wisconsin..... | 3,569 | 4,520 | 4,317 | 5,804 | 4,063 | 7,042 | 6,961 | 10,390 | 10,063 | 9,287 | 6,549 | 9,248 | 10,147 |
| Minnesota ³ | | | | | | | 254 | 470 | 432 | 446 | 497 | 722 | 926 |
| Maryland..... | 721 | 683 | 509 | 696 | 353 | 489 | 591 | 873 | 956 | 840 | 986 | 1,030 | 1,460 |
| Utah..... | 421 | 527 | 395 | 695 | 376 | 751 | 918 | 830 | 1,346 | 1,029 | 802 | 1,154 | 1,241 |
| California..... | 350 | 253 | 205 | 328 | 84 | 496 | 239 | 282 | 271 | 222 | (*) | (*) | 1,39 |
| Other States..... | 594 | 397 | 426 | 402 | 353 | 510 | 516 | 888 | 1,040 | 937 | 910 | 1,403 | 1,293 |
| United States..... | 9,829 | 11,063 | 8,685 | 12,317 | 8,207 | 13,042 | 13,948 | 19,315 | 17,816 | 17,709 | 12,936 | 17,943 | 19,223 |

Bureau of Agricultural Economics. Compiled from National Canners' Association 1917-1926; Census of Manufactures 1927-28; 1929 from The Canner, Oct. 5, 1929.

¹ Stated in cases of 24 No. 2 cans.

² Includes Delaware.

³ Previous to 1923, included in "Other States."

⁴ Included in "Other States."

TABLE 252.—*Peppers, commercial crop: Acreage, production, and price per bushel, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per bushel | | | |
|-------------------------------|--------------|--------------|--------------|--------------|----------------|----------------|----------------|----------------|--------------------------------|--------------------------|--------------------------|--------------------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>bushels</i> | <i>bushels</i> | <i>bushels</i> | <i>bushels</i> | <i>Dol-</i> | <i>Dol-</i> | <i>Dol-</i> | <i>Dol-</i> |
| | | | | | | | | | <i-lars< i=""></i-lars<> | <i-lars< i=""></i-lars<> | <i-lars< i=""></i-lars<> | <i-lars< i=""></i-lars<> |
| Fall: Florida..... | 1,940 | 1,180 | 2,510 | 920 | 1,000 885 | 1,000 406 | 1,000 643 | 1,000 157 | 1.50 | 1.69 | .93 | 3.00 |
| Early: Florida..... | 1,430 | 1,520 | 3,900 | 4,780 | 463 | 485 | 1,470 | 1,601 | 2.70 | 1.25 | 1.34 | 1.46 |
| Second Early: | | | | | | | | | | | | |
| Louisiana..... | 2,860 | 3,020 | 2,220 | 2,250 | 289 | 616 | 309 | 506 | 1.38 | 1.21 | .73 | .93 |
| Mississippi..... | 200 | 150 | 400 | 290 | 17 | 13 | 34 | 26 | 1.70 | 1.25 | .75 | 1.00 |
| North Carolina..... | 650 | 620 | 670 | 630 | 124 | 81 | 134 | 158 | 1.25 | .75 | .53 | .75 |
| South Carolina..... | | | | 86 | | | | 22 | | | | .75 |
| Total..... | 3,710 | 3,790 | 3,290 | 3,250 | 430 | 710 | 477 | 712 | 1.36 | 1.16 | .68 | .89 |
| Intermediate: New Jersey..... | 7,500 | 7,000 | 7,500 | 7,800 | 1,950 | 1,680 | 1,725 | 1,404 | .63 | .75 | .65 | .65 |
| Late: | | | | | | | | | | | | |
| California..... | 250 | 380 | 410 | 550 | 74 | 111 | 123 | 160 | .85 | .60 | 1.23 | .80 |
| Texas..... | 730 | 900 | 280 | 510 | 110 | 144 | 28 | 69 | .89 | .82 | 1.37 | 1.25 |
| Total..... | 980 | 1,280 | 690 | 1,060 | 184 | 255 | 151 | 229 | .82 | .73 | 1.25 | .93 |
| Grand total..... | 15,500 | 14,770 | 17,800 | 17,810 | 3,912 | 3,536 | 4,496 | 4,103 | 1.16 | 1.01 | .94 | 1.11 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 253.—*Pimientos for canning, commercial crop: Acreage, production, and price per ton, by States, 1926-1929*

| Group and State | Acreage | | | | Production | | | | Price per unit of production | | | |
|-------------------------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|------------------------------|--------------------------|--------------------------|--------------------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Dol-</i> | <i>Dol-</i> | <i>Dol-</i> | <i>Dol-</i> |
| | | | | | | | | | <i-lars< i=""></i-lars<> | <i-lars< i=""></i-lars<> | <i-lars< i=""></i-lars<> | <i-lars< i=""></i-lars<> |
| California ¹ | 3,510 | 3,340 | 3,250 | 2,160 | 8,390 | 10,490 | 8,420 | 7,710 | 40.00 | 40.00 | 40.00 | 40.00 |
| Georgia..... | 1,600 | 3,700 | 5,600 | 6,900 | 4,800 | 5,900 | 7,500 | 12,350 | 37.85 | 36.09 | 38.68 | 35.12 |
| Total 2 States..... | 5,110 | 7,040 | 8,850 | 9,060 | 13,190 | 16,480 | 15,920 | 20,060 | 39.27 | 38.50 | 39.39 | 36.99 |

Bureau of Agricultural Economics. Estimates based upon returns from canning establishments.

¹ Crop in California extends over into the following year.

TABLE 254.—Potatoes: Acreage, production, value, exports, etc., United States, 1909-1929

| Year | Acreage | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Whole-sale price per bushel at New York ¹ | Domestic exports, year beginning July 1 ² | Imports year beginning July 1 ² | Net balance, year beginning July 1 ³ |
|-------------------|-------------|------------------------|---------------|---|-------------------|--|--|--|---|
| | 1,000 acres | Bushels | 1,000 bushels | Cents | 1,000 dollars | Cents | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| 1909 | 3,669 | 106.1 | 389,195 | | | | | | |
| 1909 | 3,669 | 107.5 | 394,553 | 54.2 | 213,679 | 49 | 999 | 353 | +646 |
| 1910 | 3,720 | 93.8 | 349,032 | 55.7 | 194,566 | 54 | 2,384 | 219 | +2,177 |
| 1911 | 3,619 | 80.9 | 292,737 | 70.9 | 233,778 | 106 | 1,237 | 13,735 | -12,283 |
| 1912 | 3,711 | 113.4 | 420,647 | 50.5 | 212,550 | 62 | 2,028 | 337 | +1,693 |
| 1913 | 3,668 | 90.4 | 331,525 | 68.7 | 227,903 | 78 | 1,794 | 3,646 | -1,823 |
| 1914 | 3,711 | 110.5 | 409,921 | 48.7 | 193,460 | 47 | 3,135 | 271 | +2,896 |
| 1915 | 3,734 | 96.3 | 359,721 | 61.7 | 221,992 | 103 | 4,018 | 210 | +3,810 |
| 1916 | 3,565 | 80.5 | 286,953 | 146.1 | 419,333 | 238 | 2,489 | 3,079 | -558 |
| 1917 | 4,384 | 100.8 | 442,108 | 122.8 | 542,774 | 129 | 3,453 | 1,180 | +2,273 |
| 1918 | 4,295 | 95.9 | 411,860 | 119.3 | 491,527 | 127 | 3,689 | 3,534 | +205 |
| 1919 | 3,552 | 89.3 | 290,428 | | | | | | |
| 1919 | 3,542 | 91.2 | 322,867 | 159.5 | 514,855 | 284 | 3,723 | 6,941 | -3,212 |
| 1920 | 3,657 | 110.3 | 403,206 | 114.5 | 461,778 | 103 | 4,803 | 3,423 | +1,399 |
| 1921 | 3,941 | 91.8 | 361,659 | 110.1 | 398,362 | 123 | 2,327 | 2,110 | +222 |
| 1922 | 4,307 | 105.3 | 453,396 | 58.1 | 263,355 | 97 | 2,980 | 572 | +2,408 |
| 1923 | 3,816 | 109.0 | 416,165 | 78.1 | 324,889 | 118 | 3,075 | 564 | +2,512 |
| 1924 | 2,911 | 121.1 | 352,462 | | | | | | |
| 1924 | 3,310 | 126.8 | 419,560 | 62.5 | 262,097 | 78 | 3,653 | 478 | +3,187 |
| 1925 | 3,074 | 104.4 | 320,915 | 187.0 | 600,120 | 238 | 1,824 | 5,420 | -3,575 |
| 1926 | 3,120 | 113.6 | 354,458 | 141.4 | 501,186 | 161 | 2,092 | 6,349 | -4,205 |
| 1927 | 3,476 | 115.9 | 402,741 | 96.5 | 388,741 | 129 | 2,424 | 3,803 | -1,313 |
| 1928 | 3,837 | 121.3 | 465,350 | 53.9 | 251,048 | 76 | 3,165 | 2,231 | +996 |
| 1929 ⁴ | 3,370 | 106.1 | 357,451 | 131.4 | 469,701 | | | | |

Bureau of Agricultural Economics. Acreage, yield, and production figures are estimates of the crop-reporting board; italic figures are census returns. Prices received by producers are based upon returns from crop reporters. See 1927 Yearbook, p. 881, for data for earlier years.

¹ Compiled from Producers Price Current. Prices 1909-1919 are averages of the high and low weekly quotations of New York potatoes, October-June, converted from dollars per 180 pounds to cents per bushel beginning 1920, season September-May.

² Compiled from Commerce and Navigation of the United States, 1909-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1926, January and June issues, 1927-1929 and official records of the Bureau of Foreign and Domestic Commerce.

³ The difference between total exports (domestic exports plus reexports) and total imports; + indicates net exports and - indicates net imports.

⁴ Preliminary.

TABLE 255.—*Potatoes: Acreage and production, by States, average 1923-1927, annual 1926-1929*

| State and division | Acreage | | | | | Production | | | | |
|---------------------|---------------------------|----------------|----------------|----------------|-------------------|---------------------------|------------------|------------------|------------------|-------------------|
| | Average, 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ | Average, 1923- 1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| Maine..... | 138 | 127 | 161 | 181 | 172 | 36,994 | 36,830 | 37,352 | 39,820 | 47,644 |
| New Hampshire..... | 12 | 11 | 12 | 12 | 11 | 1,910 | 1,815 | 1,800 | 1,656 | 1,826 |
| Vermont..... | 21 | 20 | 21 | 21 | 19 | 3,346 | 3,100 | 3,255 | 2,982 | 2,850 |
| Massachusetts..... | 16 | 13 | 14 | 15 | 14 | 2,431 | 2,015 | 1,400 | 1,620 | 1,862 |
| Rhode Island..... | 2 | 3 | 2 | 2 | 2 | 312 | 450 | 220 | 244 | 250 |
| Connecticut..... | 16 | 14 | 15 | 17 | 16 | 2,260 | 2,170 | 1,635 | 2,210 | 2,080 |
| New York..... | 282 | 218 | 270 | 284 | 270 | 32,517 | 29,016 | 28,620 | 32,376 | 24,840 |
| New Jersey..... | 62 | 50 | 57 | 57 | 50 | 7,959 | 7,250 | 9,177 | 9,120 | 6,032 |
| Pennsylvania..... | 216 | 198 | 220 | 246 | 234 | 24,869 | 22,176 | 26,400 | 31,980 | 25,740 |
| North Atlantic..... | 765 | 694 | 772 | 835 | 788 | 112,599 | 104,822 | 109,859 | 122,008 | 113,124 |
| Ohio..... | 114 | 107 | 116 | 123 | 116 | 11,214 | 10,058 | 12,180 | 12,054 | 11,136 |
| Indiana..... | 56 | 48 | 53 | 61 | 55 | 5,210 | 3,840 | 5,035 | 6,640 | 4,620 |
| Illinois..... | 76 | 61 | 64 | 70 | 63 | 6,589 | 4,680 | 5,376 | 7,700 | 5,040 |
| Michigan..... | 270 | 249 | 289 | 306 | 263 | 29,401 | 29,880 | 23,120 | 35,802 | 18,410 |
| Wisconsin..... | 243 | 230 | 260 | 278 | 220 | 26,453 | 27,140 | 23,920 | 31,970 | 20,240 |
| Minnesota..... | 328 | 298 | 328 | 354 | 312 | 35,056 | 29,800 | 33,128 | 38,940 | 25,896 |
| Iowa..... | 78 | 74 | 75 | 81 | 75 | 6,955 | 5,846 | 6,150 | 10,935 | 7,650 |
| Missouri..... | 81 | 81 | 68 | 85 | 81 | 6,817 | 6,480 | 5,644 | 10,285 | 5,508 |
| North Dakota..... | 119 | 94 | 113 | 141 | 145 | 10,180 | 7,520 | 11,526 | 14,805 | 6,960 |
| South Dakota..... | 67 | 55 | 60 | 67 | 67 | 5,530 | 3,300 | 6,900 | 6,030 | 4,422 |
| Nebraska..... | 88 | 73 | 84 | 105 | 92 | 7,431 | 5,329 | 8,904 | 10,080 | 8,924 |
| Kansas..... | 51 | 43 | 49 | 54 | 47 | 4,556 | 3,913 | 5,390 | 7,560 | 4,375 |
| North Central..... | 1,571 | 1,413 | 1,550 | 1,725 | 1,536 | 155,390 | 137,986 | 147,273 | 192,810 | 123,181 |
| Delaware..... | 7 | 6 | 6 | 7 | 7 | 609 | 516 | 714 | 658 | 546 |
| Maryland..... | 41 | 39 | 43 | 47 | 40 | 3,723 | 3,510 | 5,246 | 5,405 | 4,000 |
| Virginia..... | 135 | 124 | 130 | 151 | 132 | 15,118 | 11,656 | 19,700 | 21,618 | 17,461 |
| West Virginia..... | 48 | 47 | 52 | 60 | 57 | 5,020 | 4,982 | 5,876 | 7,500 | 6,555 |
| North Carolina..... | 61 | 67 | 72 | 95 | 74 | 5,742 | 6,325 | 7,368 | 10,545 | 8,130 |
| South Carolina..... | 29 | 29 | 29 | 36 | 22 | 3,056 | 3,219 | 3,034 | 4,068 | 2,354 |
| Georgia..... | 19 | 19 | 17 | 22 | 20 | 1,263 | 1,197 | 1,304 | 1,682 | 1,572 |
| Florida..... | 25 | 24 | 29 | 31 | 23 | 2,606 | 2,832 | 3,045 | 3,875 | 2,714 |
| South Atlantic..... | 366 | 355 | 378 | 449 | 375 | 37,137 | 34,237 | 46,347 | 55,351 | 43,332 |
| Kentucky..... | 50 | 47 | 52 | 57 | 50 | 4,347 | 4,512 | 4,732 | 5,985 | 4,400 |
| Tennessee..... | 36 | 35 | 39 | 43 | 39 | 2,783 | 2,730 | 3,432 | 4,086 | 3,585 |
| Alabama..... | 32 | 29 | 33 | 38 | 28 | 2,394 | 2,030 | 2,475 | 2,812 | 2,408 |
| Mississippi..... | 12 | 12 | 12 | 15 | 14 | 921 | 852 | 936 | 1,329 | 1,222 |
| Arkansas..... | 30 | 32 | 29 | 36 | 31 | 1,889 | 1,920 | 1,972 | 2,700 | 2,697 |
| Louisiana..... | 32 | 36 | 41 | 41 | 31 | 2,041 | 2,196 | 2,665 | 2,870 | 1,977 |
| Oklahoma..... | 40 | 43 | 45 | 63 | 44 | 2,721 | 2,860 | 2,925 | 5,038 | 3,294 |
| Texas..... | 30 | 30 | 35 | 39 | 31 | 1,878 | 2,100 | 2,310 | 2,690 | 2,393 |
| South Central..... | 262 | 264 | 286 | 332 | 268 | 18,973 | 19,200 | 21,447 | 27,510 | 21,976 |
| Montana..... | 35 | 35 | 36 | 37 | 33 | 3,713 | 2,975 | 4,860 | 4,255 | 1,980 |
| Idaho..... | 82 | 91 | 115 | 116 | 102 | 15,599 | 16,198 | 24,380 | 19,720 | 17,136 |
| Wyoming..... | 15 | 13 | 17 | 21 | 19 | 1,652 | 1,456 | 2,329 | 2,352 | 2,090 |
| Colorado..... | 84 | 82 | 96 | 110 | 88 | 12,441 | 11,890 | 14,400 | 13,420 | 12,320 |
| New Mexico..... | 2 | 2 | 2 | 2 | 2 | 144 | 166 | 150 | 132 | 182 |
| Arizona..... | 4 | 4 | 4 | 3 | 3 | 223 | 220 | 320 | 222 | 240 |
| Utah..... | 17 | 17 | 22 | 23 | 18 | 2,488 | 2,465 | 2,970 | 3,312 | 3,330 |
| Nevada..... | 5 | 5 | 6 | 6 | 5 | 711 | 700 | 780 | 840 | 850 |
| Washington..... | 61 | 67 | 79 | 70 | 56 | 9,708 | 10,720 | 13,430 | 9,450 | 8,680 |
| Oregon..... | 44 | 45 | 52 | 52 | 42 | 4,584 | 4,500 | 6,240 | 6,240 | 3,780 |
| California..... | 47 | 43 | 52 | 56 | 35 | 7,394 | 6,923 | 7,956 | 7,728 | 5,250 |
| Far Western..... | 396 | 404 | 481 | 490 | 403 | 58,657 | 58,213 | 77,815 | 67,671 | 55,838 |
| United States..... | 3,359 | 3,120 | 3,476 | 3,837 | 3,370 | 382,756 | 354,458 | 402,741 | 465,350 | 357,451 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.

STATISTICS OF FRUITS AND VEGETABLES

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TABLE 256.—Potatoes: Yield per acre and estimated price per bushel, December 1, by States, averages, and annual, 1924-1929

| State and division | Yield per acre | | | | | | | Estimated price per bushel | | | | | | |
|---------------------|----------------------|-------|-------|-------|-------|-------|-------|----------------------------|-------|-------|-------|-------|------|-------|
| | Av. 1918- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Av. 1923- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Bush. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| Maine..... | 244 | 315 | 250 | 290 | 232 | 220 | 277 | 106 | 43 | 200 | 133 | 85 | 40 | 120 |
| New Hampshire..... | 145 | 170 | 145 | 165 | 150 | 138 | 166 | 149 | 84 | 235 | 170 | 140 | 80 | 160 |
| Vermont..... | 142 | 160 | 125 | 155 | 155 | 142 | 150 | 133 | 85 | 215 | 140 | 125 | 85 | 150 |
| Massachusetts..... | 128 | 150 | 140 | 155 | 100 | 108 | 133 | 162 | 96 | 245 | 180 | 155 | 90 | 180 |
| Rhode Island..... | 125 | 140 | 110 | 150 | 110 | 122 | 125 | 161 | 95 | 245 | 180 | 155 | 90 | 180 |
| Connecticut..... | 122 | 130 | 135 | 155 | 109 | 130 | 130 | 168 | 100 | 250 | 180 | 165 | 90 | 180 |
| New York..... | 112 | 140 | 86 | 117 | 106 | 114 | 92 | 130 | 57 | 215 | 160 | 125 | 65 | 145 |
| New Jersey..... | 127 | 150 | 106 | 145 | 161 | 160 | 121 | 134 | 67 | 230 | 155 | 110 | 50 | 160 |
| Pennsylvania..... | 107 | 118 | 123 | 112 | 120 | 130 | 110 | 134 | 80 | 194 | 170 | 120 | 65 | 160 |
| North Atlantic..... | 135.0 | 167.9 | 132.6 | 153.2 | 142.3 | 146.1 | 143.6 | 125.0 | 59.7 | 207.0 | 152.8 | 110.2 | 57.2 | 140.3 |
| Ohio..... | 87 | 88 | 106 | 94 | 105 | 98 | 96 | 136 | 89 | 200 | 170 | 120 | 75 | 155 |
| Indiana..... | 81 | 90 | 83 | 80 | 95 | 109 | 84 | 131 | 80 | 216 | 165 | 110 | 70 | 150 |
| Illinois..... | 73 | 110 | 60 | 80 | 84 | 110 | 80 | 138 | 75 | 235 | 175 | 115 | 65 | 155 |
| Michigan..... | 101 | 130 | 103 | 120 | 80 | 117 | 70 | 90 | 35 | 162 | 120 | 90 | 40 | 125 |
| Wisconsin..... | 105 | 130 | 112 | 118 | 92 | 115 | 92 | 92 | 36 | 170 | 120 | 85 | 40 | 120 |
| Minnesota..... | 99 | 132 | 97 | 100 | 101 | 110 | 83 | 79 | 27 | 154 | 115 | 60 | 30 | 100 |
| Iowa..... | 82 | 136 | 63 | 79 | 82 | 135 | 102 | 127 | 55 | 235 | 170 | 100 | 51 | 140 |
| Missouri..... | 75 | 98 | 57 | 80 | 83 | 121 | 68 | 136 | 82 | 225 | 170 | 115 | 60 | 150 |
| North Dakota..... | 85 | 90 | 72 | 80 | 102 | 105 | 48 | 79 | 39 | 150 | 120 | 50 | 30 | 105 |
| South Dakota..... | 80 | 82 | 65 | 60 | 115 | 90 | 66 | 97 | 48 | 180 | 159 | 55 | 40 | 115 |
| Nebraska..... | 82 | 87 | 75 | 73 | 106 | 96 | 97 | 109 | 62 | 180 | 160 | 75 | 50 | 110 |
| Kansas..... | 79 | 95 | 67 | 91 | 110 | 140 | 93 | 139 | 91 | 235 | 170 | 100 | 45 | 145 |
| North Central..... | 91.7 | 115.2 | 88.8 | 97.7 | 94.5 | 111.8 | 80.2 | 99.4 | 45.9 | 177.7 | 134.1 | 82.6 | 43.8 | 124.0 |
| Delaware..... | 86 | 90 | 64 | 86 | 119 | 94 | 78 | 120 | 80 | 200 | 140 | 80 | 75 | 160 |
| Maryland..... | 89 | 83 | 73 | 90 | 122 | 115 | 100 | 124 | 81 | 194 | 140 | 105 | 50 | 120 |
| Virginia..... | 110 | 131 | 90 | 94 | 152 | 143 | 132 | 127 | 82 | 195 | 140 | 130 | 50 | 125 |
| West Virginia..... | 100 | 95 | 87 | 106 | 113 | 125 | 115 | 138 | 98 | 193 | 167 | 125 | 80 | 140 |
| North Carolina..... | 91 | 105 | 78 | 94 | 102 | 111 | 110 | 144 | 112 | 180 | 160 | 150 | 65 | 120 |
| South Carolina..... | 97 | 111 | 96 | 111 | 105 | 113 | 107 | 175 | 145 | 210 | 170 | 190 | 65 | 140 |
| Georgia..... | 69 | 72 | 49 | 63 | 77 | 76 | 79 | 175 | 150 | 210 | 190 | 165 | 115 | 140 |
| Florida..... | 101 | 88 | 124 | 118 | 105 | 125 | 118 | 220 | 165 | 260 | 300 | 185 | 150 | 180 |
| South Atlantic..... | 99.1 | 108.4 | 86.0 | 96.4 | 122.6 | 123.3 | 115.6 | 143.0 | 101.2 | 200.3 | 165.4 | 137.5 | 67.3 | 131.1 |
| Kentucky..... | 82 | 100 | 60 | 96 | 91 | 105 | 88 | 141 | 102 | 200 | 155 | 130 | 80 | 135 |
| Tennessee..... | 74 | 80 | 56 | 78 | 88 | 95 | 92 | 142 | 112 | 195 | 157 | 135 | 90 | 135 |
| Alabama..... | 75 | 90 | 57 | 70 | 75 | 74 | 86 | 173 | 155 | 220 | 190 | 150 | 85 | 145 |
| Mississippi..... | 78 | 81 | 67 | 71 | 78 | 89 | 87 | 173 | 164 | 200 | 180 | 165 | 120 | 155 |
| Arkansas..... | 64 | 74 | 60 | 60 | 68 | 75 | 87 | 162 | 128 | 210 | 185 | 150 | 80 | 140 |
| Louisiana..... | 66 | 68 | 60 | 61 | 65 | 70 | 64 | 173 | 150 | 210 | 190 | 165 | 100 | 145 |
| Oklahoma..... | 65 | 70 | 72 | 67 | 65 | 80 | 75 | 167 | 130 | 225 | 170 | 180 | 75 | 130 |
| Texas..... | 61 | 67 | 53 | 70 | 68 | 69 | 77 | 187 | 170 | 240 | 200 | 165 | 100 | 150 |
| South Central..... | 71.1 | 80.5 | 60.6 | 72.7 | 75.0 | 82.9 | 82.0 | 160.6 | 130.7 | 212.2 | 174.3 | 151.4 | 87.1 | 130.6 |
| Montana..... | 107 | 88 | 108 | 85 | 135 | 115 | 60 | 99 | 87 | 160 | 120 | 65 | 55 | 170 |
| Idaho..... | 183 | 170 | 196 | 178 | 212 | 170 | 168 | 82 | 54 | 145 | 105 | 55 | 45 | 120 |
| Wyoming..... | 114 | 95 | 120 | 112 | 137 | 112 | 110 | 107 | 87 | 160 | 125 | 70 | 65 | 130 |
| Colorado..... | 142 | 145 | 195 | 145 | 150 | 122 | 140 | 91 | 60 | 155 | 130 | 55 | 45 | 110 |
| New Mexico..... | 68 | 52 | 75 | 83 | 75 | 66 | 91 | 152 | 104 | 200 | 175 | 120 | 95 | 150 |
| Arizona..... | 75 | 54 | 57 | 55 | 80 | 74 | 80 | 166 | 150 | 230 | 200 | 110 | 110 | 170 |
| Utah..... | 161 | 137 | 160 | 145 | 135 | 144 | 185 | 91 | 74 | 133 | 105 | 75 | 45 | 100 |
| Nevada..... | 151 | 131 | 170 | 140 | 130 | 140 | 170 | 123 | 106 | 190 | 130 | 85 | 85 | 150 |
| Washington..... | 148 | 150 | 155 | 160 | 170 | 135 | 155 | 95 | 85 | 165 | 95 | 60 | 50 | 145 |
| Oregon..... | 104 | 96 | 104 | 100 | 120 | 120 | 90 | 98 | 95 | 150 | 100 | 75 | 70 | 140 |
| California..... | 147 | 162 | 159 | 161 | 153 | 138 | 150 | 126 | 90 | 200 | 132 | 95 | 65 | 140 |
| Far Western..... | 141.2 | 137.7 | 158.5 | 144.1 | 161.8 | 136.4 | 138.6 | 95.9 | 74.1 | 159.5 | 113.2 | 64.0 | 52.4 | 126.6 |
| United States..... | 106.4 | 126.8 | 104.4 | 113.6 | 115.9 | 121.3 | 106.1 | 113.1 | 62.5 | 187.0 | 141.4 | 96.5 | 53.9 | 131.4 |

Bureau of Agricultural Economics. Yield figures are estimates of the crop-reporting board.
Prices are based upon returns from crop reporters.

| | | | | | | | | | | | | |
|---|--------|--------|--------|--------|--------|-------|-------|-------|-------|-----------|-----------|-----------|
| Total Northern Hemisphere reporting area and production, all years. | | | | | | | | | | | | |
| Estimated Northern Hemisphere total, excluding Russia | | | | | | | | | | | | |
| | 20,954 | 20,338 | 20,488 | 21,055 | 20,606 | 151.9 | 153.2 | 170.1 | 164.0 | 174.3 | 3,182,335 | 3,114,929 |
| | 30,100 | 30,100 | 30,000 | 31,700 | 31,100 | | | | | 4,647,000 | 4,532,000 | 5,179,000 |
| SOUTHERN HEMISPHERE | | | | | | | | | | | | |
| Brazil | | 101 | | | | | 184.7 | | | | 18,806 | 9,922 |
| Chile | 69 | 74 | 72 | | | 123.3 | 144.1 | | | | 10,664 | 11,664 |
| Argentina | 217 | 331 | 311 | 303 | | 140.6 | 90.2 | 81.3 | 84.2 | | 29,865 | 25,282 |
| Australia | 144 | 139 | 163 | | | 100.5 | 97.2 | 107.7 | | | 13,511 | 17,548 |
| Estimated Southern Hemisphere total | 700 | 1,100 | 1,500 | 1,500 | | | | | | 76,000 | 90,000 | 87,000 |
| Estimated world total, excluding Russia and China | 30,800 | 31,200 | 32,400 | 33,200 | | | | | | 4,723,000 | 4,622,000 | 5,245,000 |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Estimates given are for crops harvested in the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

¹ Average for countries having changed boundaries are estimates for present boundaries. ² 2-year average. ³ 4-year average. ⁴ 3-year average. ⁵ 1 year only.

TABLE 258.—Potatoes, early, commercial crop: Acreage, production, and price per bushel, by States, 1926-1929

| Group and State | Acreage | | | | Production | | | | Price per bushel | | | |
|---------------------------|--------------|--------------|--------------|--------------|----------------------|----------------------|----------------------|----------------------|------------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| Fall: Texas..... | 150 | 350 | 300 | 750 | 11 | 18 | 18 | 38 | 2.00 | 1.40 | 1.42 | 1.05 |
| Early: | | | | | | | | | | | | |
| Florida..... | 23,070 | 28,000 | 30,000 | 22,000 | 2,722 | 2,940 | 3,750 | 2,596 | 3.04 | 1.84 | 1.49 | 1.75 |
| Texas (Lower Valley)..... | 6,350 | 13,460 | 10,520 | 9,800 | 660 | 740 | 736 | 980 | 2.79 | 1.81 | 1.72 | 1.65 |
| Total..... | 29,420 | 41,460 | 40,520 | 31,800 | 3,382 | 3,680 | 4,486 | 3,576 | 2.99 | 1.83 | 1.53 | 1.72 |
| Alabama..... | 12,750 | 13,200 | 17,700 | 8,670 | 982 | 1,109 | 1,504 | 763 | 1.78 | 1.37 | .75 | 1.52 |
| California..... | 14,980 | 17,800 | 22,650 | 10,300 | 2,097 | 1,798 | 2,741 | 906 | 1.23 | 1.08 | .61 | 1.22 |
| Georgia..... | 2,250 | 2,250 | 2,500 | 1,550 | 191 | 259 | 225 | 150 | 2.17 | 1.96 | .80 | 1.49 |
| Louisiana..... | 20,000 | 21,860 | 21,800 | 15,100 | 1,200 | 1,421 | 1,526 | 966 | 2.06 | 1.69 | 1.00 | 1.50 |
| Mississippi..... | 1,300 | 1,700 | 1,950 | 1,560 | 104 | 136 | 176 | 137 | 1.77 | 1.27 | 1.12 | 1.55 |
| North Carolina..... | 29,000 | 36,000 | 46,400 | 25,000 | 3,480 | 4,320 | 6,403 | 3,300 | 1.68 | 1.91 | .54 | 1.10 |
| South Carolina..... | 18,720 | 18,000 | 24,000 | 14,000 | 2,527 | 2,070 | 3,360 | 1,918 | 1.72 | 1.92 | .56 | 1.30 |
| Texas (other)..... | 5,230 | 8,300 | 13,580 | 8,750 | 397 | 681 | 896 | 508 | 1.68 | 1.56 | .70 | 1.27 |
| Virginia..... | 89,000 | 78,700 | 90,900 | 77,900 | 9,345 | 14,087 | 15,908 | 11,997 | 1.32 | 1.36 | .41 | 1.18 |
| Total..... | 192,230 | 197,810 | 241,480 | 162,830 | 20,323 | 25,881 | 32,739 | 20,644 | 1.50 | 1.51 | .53 | 1.21 |
| Total, all early..... | 222,650 | 239,270 | 282,000 | 194,630 | 23,705 | 29,561 | 37,225 | 24,220 | 1.72 | 1.55 | .65 | 1.29 |
| Second early: | | | | | | | | | | | | |
| Arkansas..... | 4,180 | 3,800 | 6,030 | 3,440 | 280 | 276 | 555 | 310 | 1.50 | 1.67 | .53 | 1.00 |
| Kansas..... | 15,800 | 17,300 | 18,160 | 12,800 | 2,481 | 2,508 | 3,505 | 1,418 | .83 | .85 | .25 | 1.13 |
| Kentucky..... | 5,620 | 5,340 | 5,340 | 4,270 | 584 | 662 | 1,041 | 705 | 1.25 | .94 | .38 | 1.35 |
| Maryland..... | 14,800 | 15,400 | 17,240 | 14,650 | 1,421 | 2,156 | 2,620 | 1,831 | .97 | 1.20 | .33 | 1.20 |
| Missouri..... | 5,000 | 5,180 | 6,400 | 4,610 | 1,000 | 618 | 1,280 | 553 | .77 | 1.08 | .38 | 1.35 |
| Nebraska..... | 1,200 | 1,700 | 1,900 | 1,750 | 132 | 255 | 285 | 262 | .75 | .75 | .50 | 1.20 |
| New Jersey..... | 40,000 | 44,800 | 45,000 | 30,000 | 5,600 | 7,213 | 7,290 | 5,031 | 1.37 | .81 | .45 | 1.60 |
| Oklahoma..... | 14,400 | 15,000 | 17,000 | 12,000 | 1,411 | 1,530 | 1,428 | 1,080 | 1.52 | 2.00 | .37 | .95 |
| Tennessee..... | | 2,000 | 1,500 | | | | 228 | 165 | | | .60 | 1.16 |
| Total..... | 101,000 | 108,610 | 119,070 | 94,110 | 12,909 | 15,248 | 18,232 | 11,355 | 1.18 | 1.02 | .38 | 1.36 |
| Grand total..... | 323,800 | 348,230 | 401,370 | 289,490 | 36,625 | 44,827 | 55,475 | 35,613 | 1.53 | 1.37 | .56 | 1.31 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 259.—Potatoes: Certified seed production, 1924-1928

| State | 1924 | 1925 | 1926 | 1927 | 1928 |
|--------------------|----------------|----------------|----------------|----------------|----------------|
| | <i>Bushels</i> | <i>Bushels</i> | <i>Bushels</i> | <i>Bushels</i> | <i>Bushels</i> |
| California..... | | 12,050 | 12,075 | 17,800 | 12,000 |
| Colorado..... | 22,037 | 28,560 | 31,300 | 77,105 | 57,890 |
| Idaho..... | | 278,148 | 371,479 | 860,162 | 349,509 |
| Maine..... | 5,052,681 | 2,223,050 | 2,294,845 | 3,278,101 | 5,094,128 |
| Maryland..... | | 8,205 | 18,390 | 32,078 | 21,581 |
| Michigan..... | 291,087 | 214,656 | 337,000 | 162,397 | 854,742 |
| Minnesota..... | 777,800 | 596,005 | 693,685 | 621,999 | 1,162,540 |
| Montana..... | 31,950 | 67,800 | 113,365 | 180,562 | 236,499 |
| Nebraska..... | 79,750 | 121,200 | 60,200 | 181,500 | 152,400 |
| New Hampshire..... | 30,328 | 12,287 | 2,695 | 14,778 | 17,250 |
| New Jersey..... | 81,850 | 57,911 | 92,916 | 475 | 100,355 |
| New York..... | 363,065 | 210,700 | 225,371 | 323,080 | 470,528 |
| North Dakota..... | 101,836 | 171,110 | 181,400 | 321,305 | 539,855 |
| Ohio..... | 11,230 | 4,120 | 5,600 | 6,300 | 6,150 |
| Oregon..... | 15,900 | 27,600 | 46,000 | 87,840 | 154,237 |
| Pennsylvania..... | 65,000 | 25,965 | 41,115 | 29,870 | 60,490 |
| South Dakota..... | | 23,600 | 28,441 | 49,856 | 50,309 |
| Vermont..... | 225,000 | 108,655 | 160,031 | 252,582 | 136,119 |
| Washington..... | | 17,550 | 30,300 | 121,350 | 81,825 |
| Wisconsin..... | 357,074 | 163,025 | 196,500 | 243,000 | 448,400 |
| Wyoming..... | | 21,000 | 138,000 | 259,500 | 350,000 |
| Total..... | 7,506,587 | 4,396,797 | 5,080,708 | 7,127,640 | 10,365,807 |

Bureau of Agricultural Economics. As reported by certifying officials.

TABLE 260.—Potatoes: Car-lot shipments, by State of origin, 1927-1929

| State and year | Crop movement season ¹ | | | | | | | | | | | | | | | | |
|--------------------------------|-----------------------------------|------------|---------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|------------|
| | Apr. | May | June | July | Aug. | Sept | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Total |
| Florida: ² | | | | | | | | | | | | | | | | | |
| 1927 | Cars 3,747 | Cars 1,601 | Cars 47 | Cars 7 | Cars 1 | Cars 1 | Cars 1 | Cars 1 | Cars 27 | Cars 1 | Cars 1 | Cars 1 | Cars 1 | Cars 1 | Cars 1 | Cars 1 | Cars 5,432 |
| 1928 | 1,447 | 5,895 | 365 | 10 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7,718 |
| 1929 | 3,987 | 1,061 | 7 | 8 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7,718 |
| Texas: ⁴ | | | | | | | | | | | | | | | | | |
| 1927 | 1,224 | 1,366 | 404 | 7 | 12 | 1 | 1 | 1 | 23 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 3,049 |
| 1928 | 1,094 | 1,326 | 893 | 93 | 12 | 2 | 5 | 5 | 15 | 53 | 28 | 28 | 28 | 28 | 28 | 28 | 3,519 |
| 1929 | 1,526 | 439 | 664 | 36 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3,519 |
| Louisiana: ⁵ | | | | | | | | | | | | | | | | | |
| 1927 | 436 | 679 | 157 | 9 | 9 | 5 | 1 | 19 | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1,298 |
| 1928 | 36 | 1,167 | 488 | 3 | 3 | 1 | 1 | 4 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1,727 |
| 1929 | 92 | 746 | 251 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2,102 |
| Alabama: | | | | | | | | | | | | | | | | | |
| 1927 | 27 | 1,833 | 228 | 10 | 66 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3,133 |
| 1928 | 934 | 2,121 | 2,121 | 66 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3,133 |
| 1929 | 12 | 1,126 | 388 | 13 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3,133 |
| California: | | | | | | | | | | | | | | | | | |
| 1927 | 1 | 92 | 882 | 929 | 1,173 | 1,041 | 745 | 744 | 661 | 688 | 538 | 282 | 121 | 53 | 53 | 53 | 7,970 |
| 1928 | 6 | 392 | 974 | 607 | 678 | 794 | 828 | 711 | 688 | 836 | 533 | 406 | 79 | 30 | 30 | 30 | 7,962 |
| 1929 | 107 | 1,107 | 614 | 932 | 1,045 | 987 | 945 | 700 | 603 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3,943 |
| South Carolina: | | | | | | | | | | | | | | | | | |
| 1927 | 3,313 | 629 | 42 | 1 | 42 | 16 | 6 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4,706 |
| 1928 | 1,161 | 3,438 | 40 | 15 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7,555 |
| 1929 | 3,146 | 634 | 15 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9,736 |
| North Carolina: | | | | | | | | | | | | | | | | | |
| 1927 | 219 | 6,781 | 438 | 39 | 39 | 60 | 10 | 4 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 7,555 |
| 1928 | 13 | 7,623 | 1,008 | 533 | 390 | 390 | 113 | 33 | 7 | 5 | 8 | 2 | 1 | 1 | 1 | 1 | 9,736 |
| 1929 | 482 | 4,857 | 466 | 143 | 143 | 26 | 4 | 2 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 23,717 |
| Virginia: | | | | | | | | | | | | | | | | | |
| 1927 | 8,752 | 13,241 | 1,406 | 88 | 53 | 53 | 53 | 46 | 6 | 1 | 16 | 29 | 15 | 4 | 4 | 4 | 23,717 |
| 1928 | 8,631 | 13,913 | 4,128 | 367 | 176 | 176 | 176 | 92 | 20 | 3 | 6 | 5 | 14 | 94 | 94 | 94 | 27,679 |
| 1929 | 10,022 | 10,459 | 514 | 69 | 26 | 26 | 26 | 17 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 27,679 |

¹ Crop movement season extends from Apr. 1 of one year through July of the following year, except in Florida where the season begins in March.² Totals for April include cars moved earlier as follows: 1927, 6 in February, 547 in March, 1928, 46 in January, 57 in February, and 143 in March; 1929, 5 in January, 37 in February, and 1,013 in March.³ Preliminary.⁴ Totals for April include cars moved earlier, as follows: 1927, 158 in March, 1928, 132 in March, 1929, 3 in February and 263 in March.⁵ Total for April include cars moved in March, as follows: 1 in 1928, 6 in 1929.

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| | | | | | | | | | | | | | |
|----------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Nebraska: | | | | | | | | | | | | | |
| 1927 | 577 | 625 | 1,113 | 719 | 372 | 1,127 | 975 | 403 | 97 | 25 | 7 | 6,059 | |
| 1928 | 197 | 535 | 485 | 512 | 412 | 884 | 940 | 555 | 215 | 115 | 17 | 4,704 | |
| 1929 | 600 | 1,009 | 1,828 | 615 | 572 | | | | | | | | |
| Maine: | | | | | | | | | | | | | |
| 1927 | 467 | 3,051 | 6,759 | 4,207 | 3,948 | 4,901 | 4,624 | 3,993 | 3,903 | 4,080 | 986 | 26 | 40,945 |
| 1928 | 36 | 2,874 | 5,984 | 3,862 | 3,801 | 5,671 | 5,061 | 4,978 | 4,004 | 3,134 | 1,608 | 68 | 41,111 |
| 1929 | 1,146 | 6,931 | 8,800 | 4,724 | 5,712 | | | | | | | | |
| Wisconsin: | | | | | | | | | | | | | |
| 1927 | 297 | 1,744 | 2,215 | 1,323 | 1,020 | 1,842 | 1,970 | 2,062 | 1,374 | 990 | 584 | 4 | 15,455 |
| 1928 | 332 | 1,753 | 1,572 | 1,264 | 1,135 | 1,550 | 1,759 | 1,824 | 1,333 | 1,820 | 1,091 | 41 | 15,849 |
| 1929 | 1,462 | 1,806 | 1,681 | 1,004 | 1,493 | | | | | | | | |
| Pennsylvania: | | | | | | | | | | | | | |
| 1927 | 28 | 535 | 853 | 636 | 205 | 309 | 307 | 259 | 136 | 26 | 1 | 3,375 | |
| 1928 | 48 | 496 | 1,035 | 1,027 | 585 | 881 | 671 | 540 | 374 | 159 | 6 | 5,829 | |
| 1929 | 98 | 211 | 345 | 339 | 227 | | | | | | | | |
| Michigan: | | | | | | | | | | | | | |
| 1927 | 27 | 331 | 846 | 918 | 784 | 931 | 1,029 | 1,390 | 1,124 | 803 | 292 | 3 | 8,598 |
| 1928 | 10 | 678 | 1,977 | 1,456 | 830 | 1,457 | 1,364 | 1,684 | 1,762 | 2,038 | 932 | 15 | 14,186 |
| 1929 | 14 | 182 | 451 | 424 | 439 | | | | | | | | |
| North Dakota: | | | | | | | | | | | | | |
| 1927 | 6 | 1,249 | 3,248 | 528 | 123 | 439 | 844 | 1,183 | 258 | 50 | 3 | 7,983 | |
| 1928 | | 589 | 2,433 | 407 | 168 | 306 | 748 | 1,143 | 321 | 318 | 72 | 5 | 6,332 |
| 1929 | 2 | 1,425 | 1,869 | 291 | 157 | | | | | | | | |
| Other States: | | | | | | | | | | | | | |
| 1927 | | | | | | | | | | | | | |
| 1928 | 3 | 467 | 689 | 965 | 2,032 | | | | | | | | |
| 1929 | | 140 | 477 | 1,011 | 1,954 | | | | | | | | |
| 1929 | | 233 | 563 | 1,556 | 2,475 | | | | | | | | |
| Total: | | | | | | | | | | | | | |
| 1927 | | 5,438 | 9,375 | 20,670 | 20,896 | 17,839 | 25,003 | 38,333 | 21,124 | 13,695 | 20,232 | 22,856 | 23,434 |
| 1928 | | 2,583 | 11,928 | 26,371 | 21,015 | 16,252 | 21,127 | 29,906 | 18,252 | 13,207 | 20,015 | 20,361 | 21,678 |
| 1929 | | 5,617 | 7,340 | 19,722 | 19,534 | 17,346 | 24,089 | 31,270 | 15,299 | 14,526 | | | |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the Bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Figures for earlier years appear in 1927 and earlier Yearbooks.

¹ Preliminary.

² Includes 6 cars in February and 705 in March.

³ Includes 46 cars in January, 57 in February, and 276 in March.

⁴ Includes 5 cars in January, 40 in February and 1,282 in March.

TABLE 261.—Potatoes: Car-lot shipments, United States, by months, 1920-1929

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| 1920 | 13,752 | 9,471 | 14,612 | 9,287 | 7,043 | 14,042 | 15,317 | 14,119 | 18,875 | 32,170 | 26,067 | 10,411 | 185,176 |
| 1921 | 14,477 | 12,487 | 16,449 | 14,948 | 14,926 | 16,421 | 15,606 | 16,240 | 20,822 | 42,956 | 16,729 | 10,440 | 218,001 |
| 1922 | 16,721 | 13,722 | 22,334 | 20,059 | 20,284 | 22,104 | 18,833 | 18,239 | 24,420 | 35,193 | 21,050 | 12,448 | 245,407 |
| 1923 | 17,262 | 14,609 | 24,408 | 23,199 | 16,302 | 20,293 | 16,733 | 16,735 | 21,063 | 35,223 | 20,737 | 11,977 | 241,603 |
| 1924 | 19,762 | 20,716 | 22,940 | 19,461 | 18,736 | 20,845 | 23,626 | 16,394 | 21,387 | 34,141 | 20,852 | 13,237 | 252,007 |
| 1925 | 21,715 | 20,394 | 21,639 | 20,123 | 20,215 | 19,798 | 17,765 | 14,864 | 23,569 | 33,631 | 16,286 | 11,524 | 241,623 |
| 1926 | 16,185 | 14,834 | 19,974 | 14,238 | 16,903 | 23,587 | 20,310 | 15,327 | 22,078 | 36,182 | 18,419 | 13,487 | 232,424 |
| 1927 | 17,974 | 17,781 | 21,497 | 20,283 | 16,691 | 22,153 | 21,053 | 17,853 | 25,003 | 38,353 | 21,124 | 13,095 | 253,445 |
| 1928 | 20,278 | 22,913 | 23,710 | 17,255 | 23,740 | 29,675 | 21,084 | 16,252 | 21,127 | 29,906 | 18,232 | 13,207 | 257,343 |
| 1929 | 20,020 | 20,401 | 22,960 | 20,138 | 20,362 | 24,700 | 19,697 | 17,346 | 24,089 | 31,270 | 15,299 | 14,826 | 261,168 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis, 400 to 700 bushels to a carload.

¹ Preliminary.

TABLE 262.—Potatoes: International trade, average 1911-1913, annual 1925-1928

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Average, 1911-1913 | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> |
| Netherlands | 1,952 | 16,451 | 434 | 15,552 | 494 | 18,387 | 748 | 16,988 | 1,231 | 17,833 |
| France | 7,143 | 8,683 | 6,795 | 10,350 | 14,449 | 8,186 | 9,821 | 9,347 | 13,653 | 12,653 |
| Italy | 242 | 3,975 | 212 | 7,731 | 461 | 9,524 | 505 | 8,295 | 4,265 | 7,612 |
| Poland | 0 | 0 | 35 | 3,535 | 4 | 4,468 | 8 | 5,103 | 8 | 2,029 |
| Belgium | 4,921 | 8,692 | 4,804 | 3,778 | 4,502 | 9,400 | 3,813 | 6,951 | 4,166 | 14,249 |
| Canada | 525 | 1,207 | 572 | 6,281 | 467 | 8,169 | 504 | 7,087 | 708 | 6,309 |
| Argentina | 1,337 | 543 | 281 | 1,252 | 226 | 2,234 | 8 | 2,966 | | 1,901 |
| Spain | 0 | 1,835 | 1,248 | 1,321 | 218 | 2,227 | | | | |
| Hungary | 0 | 0 | 117 | 1,238 | 82 | 4,987 | 211 | 2,662 | 435 | 2,255 |
| Czechoslovakia | 0 | 0 | 574 | 179 | 1,708 | 46 | 1,498 | 2,729 | 534 | 1,208 |
| Estonia | 0 | 0 | 0 | 851 | 1 | 396 | 3 | 1,310 | 0 | 1,399 |
| Japan | 0 | 440 | 0 | 474 | 0 | 485 | 0 | 733 | 0 | 728 |
| Denmark | 40 | 928 | 357 | 90 | 217 | 117 | 741 | 47 | 2,028 | 38 |
| China | 36 | 288 | 0 | 169 | 0 | 175 | 0 | 124 | | |
| Russia | 309 | 7,762 | 15 | 129 | 17 | 135 | 16 | 1,066 | | |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom | 11,382 | 6,246 | 18,331 | 1,614 | 12,618 | 1,937 | 10,838 | 3,039 | 17,774 | 1,850 |
| Germany | 29,180 | 12,412 | 14,395 | 9,774 | 15,975 | 3,565 | 23,484 | 2,537 | 17,956 | 6,683 |
| Cuba | 2,001 | 2 | 4,827 | 9 | 3,570 | 49 | 4,076 | 78 | | |
| Austria | 4,070 | 1,451 | 2,215 | 133 | 3,873 | 129 | 2,424 | 194 | 2,066 | 3,001 |
| Switzerland | 3,172 | 42 | 2,264 | 6 | 2,615 | 4 | 1,887 | 3 | 2,822 | 5 |
| Uruguay | 3,768 | 1 | 1,536 | 0 | 1,631 | 1 | 1,452 | 1 | 1,201 | |
| United States | 5,707 | 1,814 | 2,433 | 2,323 | 5,728 | 2,033 | 5,272 | 2,379 | 3,244 | 2,698 |
| Algeria | 1,218 | 931 | 1,313 | 1,795 | 1,165 | 1,553 | 1,381 | 1,152 | 1,783 | 1,396 |
| Portugal | 273 | 500 | 1,398 | 155 | 1,178 | 1,269 | | | | |
| Finland | 479 | 15 | 635 | 0 | 493 | 0 | 327 | 2 | 738 | |
| Egypt | 599 | 28 | 841 | 77 | 827 | 77 | 853 | 101 | 753 | 247 |
| Irish Free State | 0 | 0 | 707 | 741 | 880 | 636 | 566 | 1,018 | 322 | 1,350 |
| Brazil | 939 | 0 | 496 | 2 | 1,588 | 0 | 1,314 | 0 | 1,023 | |
| Tunis | 294 | 2 | 361 | 3 | 357 | 3 | 436 | 2 | 409 | 3 |
| Sweden | 700 | 64 | 344 | 3 | 36 | 16 | 615 | 158 | 1,082 | 1 |
| Philippine Islands | 334 | 0 | 322 | 0 | 336 | 0 | 345 | 0 | | |
| Norway | 215 | 60 | 157 | 20 | 1 | 76 | 52 | 87 | 99 | 15 |
| Total 32 countries | 77,836 | 74,372 | 68,019 | 69,385 | 75,707 | 79,184 | 73,188 | 76,759 | 78,309 | 86,363 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. These figures do not include sweetpotatoes.

¹ International Yearbook of Agricultural Statistics.

² Average for Austria-Hungary.

³ 1 year only.

⁴ 2-year average.

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TABLE 263.—*Potatoes: Estimated average price per bushel, received by producers, United States, 1909-1929*

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weighted average |
|---------------------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|------------------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1900 | 88.0 | 78.3 | 67.9 | 61.0 | 56.0 | 55.0 | 56.1 | 55.4 | 51.0 | 42.9 | 37.9 | 38.8 | 57.9 |
| 1910 | 52.5 | 68.9 | 70.4 | 61.8 | 55.7 | 54.9 | 54.6 | 55.2 | 55.4 | 59.0 | 62.9 | 79.8 | 61.3 |
| 1911 | 116.2 | 124.8 | 101.0 | 82.3 | 78.1 | 82.2 | 89.4 | 98.2 | 109.6 | 122.2 | 123.5 | 111.6 | 99.6 |
| 1912 | 95.0 | 75.8 | 58.0 | 48.3 | 48.0 | 50.6 | 51.8 | 52.6 | 51.2 | 49.2 | 51.7 | 52.5 | 55.6 |
| 1913 | 59.5 | 72.2 | 74.6 | 71.8 | 69.2 | 68.6 | 69.0 | 70.2 | 70.4 | 70.7 | 71.4 | 76.4 | 70.6 |
| 1914 | 84.3 | 81.0 | 69.8 | 58.8 | 50.8 | 49.2 | 50.0 | 50.4 | 49.1 | 49.2 | 50.6 | 51.4 | 58.0 |
| 1915 | 54.2 | 53.4 | 49.6 | 54.8 | 61.2 | 66.2 | 79.3 | 91.2 | 96.0 | 96.2 | 96.8 | 100.6 | 70.8 |
| 1916 | 98.8 | 102.4 | 110.6 | 123.8 | 140.9 | 146.7 | 159.8 | 206.6 | 237.7 | 257.2 | 276.8 | 261.0 | 166.3 |
| 1917 | 209.4 | 155.0 | 130.6 | 125.0 | 125.3 | 121.9 | 122.0 | 121.6 | 106.4 | 86.4 | 77.8 | 85.2 | 122.5 |
| 1918 | 118.2 | 145.2 | 146.2 | 135.4 | 123.2 | 117.7 | 115.2 | 111.9 | 107.4 | 112.2 | 120.2 | 124.9 | 125.6 |
| 1919 | 160.6 | 190.2 | 175.8 | 158.5 | 156.2 | 169.0 | 198.1 | 230.6 | 269.6 | 344.6 | 407.4 | 403.6 | 223.8 |
| 1920 | 344.4 | 243.9 | 159.8 | 126.6 | 116.4 | 110.0 | 100.6 | 89.8 | 80.9 | 72.9 | 67.6 | 68.5 | 131.5 |
| 1921 | 103.4 | 152.8 | 153.1 | 130.6 | 116.8 | 109.4 | 112.0 | 116.6 | 115.7 | 109.0 | 104.2 | 103.7 | 121.3 |
| 1922 | 109.0 | 101.4 | 78.8 | 66.2 | 60.5 | 58.8 | 62.0 | 64.2 | 68.6 | 77.4 | 79.0 | 79.8 | 73.9 |
| 1923 | 102.9 | 120.8 | 109.6 | 91.4 | 82.5 | 81.5 | 86.4 | 88.1 | 87.8 | 91.1 | 91.3 | 100.7 | 94.2 |
| 1924 | 109.0 | 111.3 | 81.0 | 68.8 | 63.5 | 64.1 | 70.2 | 72.3 | 71.4 | 70.5 | 70.6 | 84.4 | 76.5 |
| 1925 | 125.5 | 155.4 | 121.1 | 125.6 | 198.4 | 201.5 | 220.5 | 226.0 | 225.6 | 270.5 | 244.8 | 190.1 | 183.5 |
| 1926 | 174.6 | 140.5 | 130.6 | 126.4 | 141.3 | 137.0 | 139.1 | 134.1 | 127.0 | 126.8 | 146.0 | 191.0 | 140.8 |
| 1927 | 183.1 | 146.3 | 107.4 | 97.9 | 95.4 | 94.1 | 93.6 | 96.2 | 113.1 | 116.8 | 103.3 | 83.6 | 108.4 |
| 1928 | 77.9 | 73.1 | 64.8 | 58.0 | 56.9 | 57.7 | 58.9 | 59.5 | 58.4 | 55.3 | 59.3 | 63.3 | 61.3 |
| 1929 | 87.0 | 138.6 | 135.5 | 138.2 | 134.8 | 135.3 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices weighted by production of potatoes for each State; yearly price obtained by weighing monthly prices by average monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1909-December, 1923.

TABLE 264.—*Potatoes: Shipping-point price, per 100 pounds in car lots, Minneapolis, 1919-1929*¹

| Year | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June |
|------|-------------------|-------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 1919 | 2.97 | 2.55 | 2.36 | 2.63 | 3.00 | 4.22 | 4.16 | 5.21 | 6.89 | 7.14 | ----- |
| 1920 | ² 2.62 | ² 1.98 | 1.57 | 1.82 | 1.34 | 1.14 | .95 | 1.14 | .85 | .79 | ----- |
| 1921 | ² 2.20 | 1.95 | 1.72 | 1.47 | 1.45 | 1.73 | 1.58 | 1.43 | 1.32 | 1.41 | 1.62 |
| 1922 | ² .99 | ² .92 | ² .77 | .69 | .64 | .62 | .61 | .86 | 1.08 | .84 | .69 |
| 1923 | 1.54 | 1.19 | .86 | .81 | .85 | 1.12 | 1.08 | 1.04 | 1.15 | 1.09 | 1.48 |
| 1924 | ----- | .77 | .67 | .68 | .73 | .90 | .87 | .84 | .69 | .99 | 1.28 |
| 1925 | 2.11 | 1.83 | 2.39 | 3.39 | 3.48 | 3.92 | 3.55 | 3.85 | 4.49 | 3.11 | ----- |
| 1926 | ----- | 2.20 | 2.19 | 2.21 | 2.09 | 2.08 | 1.81 | 1.78 | 1.91 | 2.96 | 3.98 |
| 1927 | 1.42 | 1.32 | 1.26 | 1.30 | 1.32 | 1.36 | 1.58 | 1.98 | 1.58 | 1.22 | .99 |
| 1928 | .69 | .76 | .65 | .68 | ----- | ----- | .72 | .67 | .63 | .68 | ----- |
| 1929 | 2.04 | 2.22 | 2.14 | 2.05 | 2.13 | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives. Average prices as shown are based on stock of U. S. No. 1 grade; they are simple averages of daily range of selling prices.

¹ Minneapolis-St. Paul freight rate.

² Field run and partly graded.

TABLE 265.—*Potatoes: Average l. c. l. price per 100 pounds, to jobbers, at three markets, 1919-1929*

| Market, and season beginning April ¹ | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| New York: | | | | | | | | | | | | | | |
| 1919 | 6.25 | 4.29 | 4.37 | 3.43 | 3.39 | 2.79 | 2.57 | 2.63 | 3.09 | 4.23 | 4.49 | 5.49 | 7.58 | 7.19 |
| 1920 | | 9.03 | 6.93 | 5.54 | 2.56 | 1.83 | 1.93 | 1.96 | 1.82 | 1.80 | 1.31 | 1.51 | 1.28 | 1.22 |
| 1921 | 4.41 | 4.18 | 1.90 | 2.23 | 2.90 | 2.11 | 2.09 | 1.92 | 2.07 | 2.33 | 2.18 | 2.03 | 1.79 | 1.58 |
| 1922 | 4.07 | 3.27 | 3.03 | 1.81 | 1.04 | .95 | .96 | 1.22 | 1.36 | 1.39 | 1.44 | 1.87 | 2.09 | 1.76 |
| 1923 | 7.24 | 4.13 | 3.08 | 3.08 | 2.57 | 1.49 | 1.85 | 1.67 | 1.59 | 1.96 | 2.01 | 1.96 | 2.12 | 1.73 |
| 1924 | 5.92 | 4.12 | 2.34 | 1.48 | 1.41 | 1.37 | 1.33 | 1.22 | 1.26 | 1.46 | 1.56 | 1.21 | 1.20 | 1.36 |
| 1925 | 4.03 | 3.34 | 2.83 | 3.18 | 2.83 | 2.43 | 3.23 | 4.09 | 4.20 | 4.61 | 4.57 | 4.67 | 5.64 | 4.10 |
| 1926 | 8.84 | 6.29 | 3.78 | 2.29 | 2.38 | 2.57 | 2.89 | 2.99 | 2.92 | 2.80 | 2.48 | 2.45 | 2.46 | 3.64 |
| 1927 | 4.15 | 4.50 | 4.03 | 2.07 | 1.83 | 2.11 | 2.26 | 2.26 | 2.17 | 2.25 | 2.64 | 2.96 | 2.68 | 1.94 |
| 1928 | 6.32 | 2.89 | 1.54 | 1.02 | 1.24 | 1.34 | 1.37 | 1.22 | 1.41 | 1.52 | 1.45 | 1.36 | 1.48 | 1.67 |
| 1929 | 4.13 | 3.71 | 2.30 | 2.80 | 3.27 | 3.04 | 3.14 | 3.08 | 3.05 | | | | | |
| Chicago: | | | | | | | | | | | | | | |
| 1919 | 6.40 | 5.32 | 4.33 | 4.18 | 3.99 | 2.73 | 2.40 | 2.90 | 3.83 | 5.54 | 4.80 | 6.00 | 6.98 | 7.40 |
| 1920 | | 9.14 | 8.38 | 6.44 | 3.42 | 2.40 | 1.85 | 2.13 | 1.58 | 1.29 | 1.15 | 1.25 | 1.98 | 2.87 |
| 1921 | 4.83 | 4.50 | 2.42 | 2.33 | 3.11 | 2.65 | 2.00 | 1.75 | 1.83 | 1.98 | 1.96 | 2.18 | 1.69 | 2.17 |
| 1922 | 4.16 | 3.57 | 3.03 | 2.29 | 1.63 | 1.17 | 1.00 | 1.05 | .96 | 1.02 | 1.07 | 1.35 | 1.53 | 2.13 |
| 1923 | | 4.80 | 3.15 | 2.76 | 2.18 | 1.70 | 1.14 | 1.24 | 1.27 | 1.58 | 1.71 | 1.75 | 1.79 | 1.50 |
| 1924 | 5.68 | 4.69 | 2.65 | 1.76 | 1.40 | 1.32 | .97 | 1.31 | 1.36 | 1.47 | 1.63 | 1.44 | 1.84 | 1.18 |
| 1925 | 4.75 | 3.90 | 2.96 | 3.28 | 2.68 | 2.00 | 2.67 | 3.47 | 3.64 | 4.08 | 3.81 | 4.04 | 4.62 | 3.23 |
| 1926 | 8.59 | 6.57 | 3.91 | 2.35 | 2.22 | 2.45 | 2.49 | 2.65 | 2.47 | 2.55 | 2.37 | 2.42 | 2.68 | 3.51 |
| 1927 | 4.52 | 4.48 | 4.65 | 2.30 | 2.02 | 1.82 | 1.60 | 1.60 | 1.55 | 1.63 | 1.84 | 2.36 | 2.83 | 1.43 |
| 1928 | 5.95 | 2.94 | 1.74 | 1.15 | 1.06 | 1.04 | 1.16 | 1.24 | 1.24 | 1.31 | 1.27 | 1.19 | 1.21 | 1.36 |
| 1929 | 3.94 | 3.04 | 2.71 | 2.78 | 2.45 | 2.64 | 2.62 | 2.57 | 2.54 | | | | | |
| Boston: | | | | | | | | | | | | | | |
| 1919 | | 5.00 | 4.64 | 4.19 | 3.76 | 2.54 | 2.26 | 2.67 | 3.06 | 4.12 | 4.39 | 5.23 | 6.25 | 7.03 |
| 1920 | | 9.18 | 7.97 | 6.13 | 3.02 | 2.17 | 2.20 | 2.36 | 1.95 | 1.78 | 1.39 | 1.41 | 1.16 | .94 |
| 1921 | 4.82 | 4.76 | 2.36 | 2.63 | 3.29 | 2.22 | 1.87 | 1.90 | 1.88 | 2.31 | 2.03 | 1.80 | 1.51 | 1.36 |
| 1922 | 4.80 | 3.86 | 3.54 | 2.33 | 1.48 | 1.20 | 1.20 | 1.38 | 1.31 | 1.44 | 1.47 | 1.76 | 2.18 | 1.98 |
| 1923 | | 5.14 | 3.57 | 3.64 | 3.21 | 2.04 | 1.72 | 1.66 | 1.61 | 1.93 | 1.93 | 1.86 | 1.93 | 1.92 |
| 1924 | 6.03 | 5.37 | 2.72 | 1.90 | 1.59 | 1.41 | 1.12 | 1.09 | 1.12 | 1.28 | 1.47 | 1.12 | .99 | 1.17 |
| 1925 | 4.46 | 3.81 | 3.21 | 2.68 | 3.00 | 2.01 | 3.04 | 4.12 | 4.17 | 4.66 | 4.46 | 4.62 | 5.79 | 4.14 |
| 1926 | 7.73 | 6.51 | 4.24 | 2.17 | 2.87 | 2.21 | 2.66 | 2.95 | 2.82 | 2.77 | 2.48 | 2.12 | 2.37 | 3.43 |
| 1927 | 4.43 | 4.80 | 4.53 | 2.28 | 2.11 | 2.46 | 1.94 | 2.03 | 1.93 | 2.02 | 2.36 | 2.83 | 2.49 | 1.80 |
| 1928 | | 3.28 | 1.84 | 1.19 | 1.40 | 1.26 | 1.15 | 1.15 | 1.15 | 1.27 | 1.24 | 1.18 | 1.24 | 1.56 |
| 1929 | 3.98 | 3.93 | 2.63 | 3.03 | 3.20 | 2.63 | 2.65 | 2.53 | 2.54 | | | | | |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of U. S. No. 1 grade; they are simple averages of daily range of selling prices. In some cases conversions were made from larger to smaller units or vice versa, in order to obtain comparability.

¹ Crop movement season extends from April of one year through May of the following year, with irregular quotations continuing through June and July.

² Car-lot sales.

TABLE 266.—*Potatoes, Maine and New York State: Average l. c. l. price per bushel to jobbers at New York, 1909-1929*

| Season beginning September | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1909 | 65 | 56 | 56 | 56 | 58 | 54 | 49 | 40 | 30 |
| 1910 | 55 | 55 | 51 | 49 | 52 | 49 | 47 | 62 | 57 |
| 1911 | 81 | 79 | 90 | 95 | 112 | 114 | 128 | 138 | 125 |
| 1912 | 60 | 59 | 64 | 68 | 63 | 67 | 62 | 66 | 77 |
| 1913 | 74 | 69 | 71 | 70 | 80 | 83 | 81 | 85 | 85 |
| 1914 | 62 | 56 | 54 | 51 | 51 | 48 | 47 | 50 | 46 |
| 1915 | | 78 | 76 | 90 | 122 | 121 | 123 | 114 | 112 |
| 1916 | 118 | 125 | 169 | 161 | 198 | 267 | 267 | 300 | 318 |
| 1917 | 120 | 162 | 137 | 139 | 166 | 147 | 114 | 111 | 82 |
| 1918 | 158 | 144 | 137 | 150 | 142 | 126 | 111 | 143 | 149 |
| 1919 | 151 | 137 | 157 | 179 | 231 | 264 | 333 | 428 | 417 |
| 1920 | | 125 | 138 | 127 | 116 | 88 | 88 | 78 | 66 |
| 1921 | 137 | 116 | 125 | 123 | 143 | 135 | 125 | 112 | 90 |
| 1922 | 86 | 78 | 82 | 86 | 93 | 96 | 121 | 125 | 110 |
| 1923 | 146 | 113 | 106 | 105 | 120 | 120 | 117 | 119 | 117 |
| 1924 | 91 | 72 | 70 | 73 | 82 | 94 | 73 | 71 | 76 |
| 1925 | 128 | 176 | 228 | 242 | 261 | 262 | 268 | 338 | 241 |
| 1926 | 140 | 162 | 171 | 170 | 161 | 146 | 142 | 143 | 216 |
| 1927 | 111 | 120 | 121 | 118 | 124 | 139 | 166 | 148 | 114 |
| 1928 | 78 | 69 | 68 | 72 | 77 | 76 | 72 | 81 | 91 |
| 1929 | 164 | 167 | | 158 | | | | | |

Bureau of Agricultural Economics. Compiled from Friday or Saturday issues, New York Producers' Price Current, average of weekly range.

In earlier years New York "State" quotations were included in the general term "State and Western." Earlier data are available in 1925 Yearbook, p. 928, Table 276.

TABLE 267.—*Spinach for consumption, fresh, commercial crop: Acreage, production, price per bushel, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per bushel | | | |
|-----------------------|--------------|--------------|--------------|--------------|----------------------|----------------------|----------------------|----------------------|--------------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| Arkansas..... | | 450 | 960 | 500 | | 68 | 182 | 92 | | 0.70 | 0.80 | 0.75 |
| California 1..... | 2,290 | 1,900 | 1,000 | 1,400 | 1,832 | 1,520 | 753 | 1,085 | 0.27 | .30 | .52 | .40 |
| Louisiana..... | 5,100 | 6,430 | 6,900 | 6,930 | 1,392 | 1,061 | 738 | 1,074 | .65 | .34 | .48 | .48 |
| Maryland..... | 2,130 | 2,130 | 2,020 | 2,070 | 1,012 | 1,118 | 753 | 828 | .43 | .32 | .36 | .40 |
| Missouri..... | 1,200 | 1,200 | 1,250 | 1,310 | 432 | 432 | 470 | 367 | .60 | .68 | .70 | .65 |
| New Jersey..... | 2,600 | 2,600 | 5,000 | 5,300 | 806 | 715 | 1,625 | 1,473 | .60 | .78 | .74 | .66 |
| North Carolina..... | | 320 | 170 | 110 | | 80 | 48 | 28 | | .67 | .96 | .75 |
| South Carolina..... | 2,000 | 900 | 600 | 780 | 632 | 164 | 180 | 140 | .72 | .85 | .99 | .79 |
| Texas 1..... | 16,820 | 19,450 | 25,600 | 28,650 | 5,130 | 6,457 | 5,120 | 8,595 | .49 | .50 | .45 | .35 |
| Virginia 1..... | 8,050 | 7,860 | 7,500 | 7,700 | 1,731 | 2,468 | 1,980 | 2,110 | .73 | .61 | .81 | .08 |
| Washington..... | | 290 | 310 | 330 | | 116 | 108 | 116 | | .30 | .36 | .41 |
| Total or average..... | 40,190 | 43,530 | 51,350 | 55,080 | 12,067 | 14,199 | 11,957 | 15,908 | .52 | .50 | .57 | .45 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

1 Crop season begins in November of previous year.

TABLE 268.—*Spinach for canning, commercial crop: Acreage, production, and price per ton, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per ton | | | |
|-----------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|-----------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| California..... | 9,500 | 10,300 | 12,340 | 15,790 | 46,000 | 51,500 | 65,400 | 90,000 | 15.15 | 14.50 | 16.02 | 15.35 |
| Maryland..... | 1,420 | 1,420 | 1,660 | 1,700 | 4,000 | 4,400 | 3,700 | 4,100 | 30.62 | 32.80 | 37.50 | 35.50 |
| Total..... | 11,010 | 11,720 | 14,000 | 17,490 | 50,000 | 55,900 | 69,100 | 94,100 | 17.30 | 15.94 | 17.18 | 16.24 |

Bureau of Agricultural Economics. Estimates based upon returns from canning establishments.

TABLE 269.—*Spinach: Carlot shipments, by State of origin, 1920-1929*

| State | Crop-movement season 1 | | | | | | | | | |
|---------------------|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 2 |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| Missouri..... | 5 | 132 | 53 | 46 | 103 | 113 | 100 | 33 | 100 | 27 |
| Maryland 3..... | 292 | 393 | 603 | 798 | 725 | 619 | 846 | 670 | 749 | 626 |
| Virginia..... | 1,372 | 2,475 | 2,212 | 3,208 | 3,107 | 2,946 | 2,669 | 3,213 | 3,058 | 2,974 |
| South Carolina..... | | | 161 | 422 | 161 | 501 | 614 | 462 | 282 | 111 |
| Texas..... | 861 | 1,463 | 1,455 | 2,433 | 3,038 | 3,235 | 4,513 | 4,495 | 5,528 | 5,559 |
| California..... | 326 | 149 | 302 | 473 | 70 | 241 | 205 | 445 | 334 | 494 |
| Washington 4..... | 4 | 19 | 13 | 23 | 40 | 123 | 121 | 145 | 155 | 153 |
| Other States 5..... | 432 | 115 | 115 | 177 | 263 | 141 | 215 | 192 | 309 | 394 |
| Total..... | 2,892 | 4,746 | 4,914 | 7,580 | 7,507 | 7,919 | 9,383 | 9,655 | 10,575 | 10,340 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

1 Crop-movement season extends from October of the preceding year through December of the year shown.

2 Preliminary.

3 Figures include shipments in January of succeeding crop year as follows: Maryland, 1922, 5 cars; 1923, 4 cars; Washington, 1925, 4 cars; New Jersey, 1923, 1 car.

4 Includes 1 car from New Mexico in March, 1921.

TABLE 270.—*Sweetpotatoes: Acreage, production, and value, United States, 1909-1929*

| Year | Acreage | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 | Year | Acreage | Average yield per acre | Production | Price per bushel received by producers Dec. 1 | Farm value Dec. 1 |
|-----------|-------------|------------------------|---------------|---|-------------------|-------------------------|-------------|------------------------|---------------|---|-------------------|
| | 1,000 acres | Bushels | 1,000 bushels | Cents | 1,000 dollars | | 1,000 acres | Bushels | 1,000 bushels | Cents | 1,000 dollars |
| 1909..... | 641 | 82.4 | 59,252 | | | 1919..... | 822 | 103.0 | 84,661 | 94.5 | 80,015 |
| 1909..... | 641 | 90.1 | 57,764 | 68.5 | 39,585 | 1920..... | 902 | 104.8 | 103,925 | 113.4 | 117,834 |
| 1910..... | 641 | 93.5 | 59,938 | 67.1 | 40,216 | 1921..... | 1,066 | 92.5 | 98,654 | 88.1 | 80,894 |
| 1911..... | 605 | 90.1 | 54,538 | 75.5 | 41,202 | 1922..... | 1,117 | 97.9 | 109,394 | 77.1 | 84,295 |
| 1912..... | 583 | 95.2 | 55,479 | 72.6 | 40,204 | 1923..... | 963 | 97.9 | 97,177 | 97.9 | 95,091 |
| 1913..... | 625 | 94.5 | 59,057 | 72.6 | 42,884 | 1924..... | 967 | 80.2 | 77,444 | | |
| 1914..... | 603 | 93.8 | 56,574 | 73.0 | 41,204 | 1924..... | 688 | 78.4 | 53,912 | 128.8 | 69,444 |
| 1915..... | 731 | 103.5 | 75,639 | 62.1 | 46,980 | 1925..... | 779 | 80.0 | 62,319 | 136.4 | 85,034 |
| 1916..... | 774 | 91.7 | 70,955 | 84.8 | 60,141 | 1926..... | 819 | 101.0 | 82,703 | 95.5 | 78,956 |
| 1917..... | 919 | 91.2 | 83,822 | 110.8 | 92,916 | 1927..... | 933 | 100.9 | 94,112 | 82.5 | 77,615 |
| 1918..... | 940 | 93.5 | 87,924 | 135.2 | 118,863 | 1928..... | 810 | 95.9 | 77,661 | 91.5 | 71,096 |
| 1919..... | 804 | 97.2 | 78,092 | | | 1929 ¹ | 822 | 103.0 | 84,661 | 94.5 | 80,015 |

Bureau of Agricultural Economics. Acreage, yield, and production figures are estimates of the crop-reporting board; italic figures are census returns. Prices are based upon returns from crop reporters.

¹ Preliminary.

TABLE 271.—*Sweetpotatoes: Acreage and production, by States, average 1923-1927, annual 1926-1929*

| State | Acreage | | | | | Production | | | | |
|---------------------|--------------------|-------------|-------------|-------------|-------------------|--------------------|---------------|---------------|---------------|-------------------|
| | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ¹ | Average, 1923-1927 | 1926 | 1927 | 1928 | 1929 ¹ |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels |
| New Jersey..... | 16 | 17 | 15 | 15 | 15 | 2,105 | 2,465 | 1,890 | 2,175 | 2,100 |
| Ohio..... | 3 | 3 | 3 | 3 | 3 | 330 | 315 | 399 | 360 | 375 |
| Indiana..... | 2 | 3 | 2 | 2 | 2 | 271 | 330 | 224 | 232 | 250 |
| Illinois..... | 10 | 13 | 10 | 10 | 10 | 1,052 | 1,430 | 1,030 | 980 | 1,020 |
| Iowa..... | 3 | 3 | 3 | 3 | 3 | 285 | 309 | 270 | 369 | 315 |
| Missouri..... | 11 | 10 | 12 | 11 | 12 | 1,165 | 1,120 | 1,344 | 1,155 | 1,320 |
| Kansas..... | 3 | 4 | 3 | 2 | 2 | 386 | 516 | 408 | 260 | 240 |
| Delaware..... | 8 | 9 | 8 | 7 | 8 | 986 | 1,251 | 880 | 980 | 1,160 |
| Maryland..... | 10 | 11 | 11 | 10 | 10 | 1,370 | 1,815 | 1,584 | 1,500 | 1,250 |
| Virginia..... | 40 | 43 | 43 | 44 | 45 | 4,931 | 5,375 | 5,805 | 6,336 | 6,705 |
| West Virginia..... | 3 | 3 | 2 | 2 | 2 | 309 | 330 | 220 | 204 | 240 |
| North Carolina..... | 87 | 84 | 89 | 80 | 78 | 8,521 | 7,560 | 10,146 | 7,840 | 9,126 |
| South Carolina..... | 59 | 47 | 53 | 49 | 50 | 4,888 | 3,760 | 5,300 | 4,214 | 5,750 |
| Georgia..... | 118 | 110 | 132 | 119 | 124 | 8,740 | 9,460 | 10,560 | 10,234 | 11,780 |
| Florida..... | 28 | 28 | 29 | 28 | 29 | 2,595 | 2,800 | 2,668 | 2,464 | 3,190 |
| Kentucky..... | 16 | 17 | 16 | 14 | 15 | 1,562 | 2,040 | 1,488 | 1,246 | 1,365 |
| Tennessee..... | 40 | 50 | 48 | 41 | 44 | 4,159 | 6,150 | 4,704 | 3,895 | 4,400 |
| Alabama..... | 76 | 65 | 78 | 70 | 74 | 6,965 | 6,500 | 7,644 | 6,510 | 7,622 |
| Mississippi..... | 67 | 55 | 69 | 55 | 59 | 6,370 | 5,720 | 7,728 | 6,050 | 7,670 |
| Arkansas..... | 35 | 34 | 38 | 28 | 26 | 3,425 | 3,672 | 4,408 | 2,520 | 1,716 |
| Louisiana..... | 78 | 79 | 99 | 74 | 80 | 6,518 | 7,110 | 9,702 | 6,600 | 7,440 |
| Oklahoma..... | 23 | 24 | 23 | 20 | 15 | 2,221 | 2,520 | 2,438 | 1,780 | 990 |
| Texas..... | 93 | 92 | 133 | 109 | 104 | 7,506 | 8,556 | 11,970 | 8,284 | 7,384 |
| New Mexico..... | 1 | 1 | 1 | 1 | 1 | 126 | 135 | 102 | 119 | 123 |
| Arizona..... | 2 | 2 | 1 | 1 | 1 | 254 | 300 | 120 | 142 | 140 |
| California..... | 9 | 12 | 12 | 12 | 10 | 901 | 1,164 | 1,080 | 1,152 | 990 |
| United States... | 842 | 819 | 933 | 810 | 822 | 78,045 | 82,703 | 94,112 | 77,661 | 84,661 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.

TABLE 272.—*Sweetpotatoes: Yield per acre and estimated price per bushel, December 1 by States, averages, and annual 1924-1929*

| State | Yield per acre | | | | | | | Estimated price per bushel | | | | | | |
|---------------------|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Av., 1918- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | Av., 1923- 1927 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | <i>Bus.</i> | <i>Bus.</i> | <i>Bus.</i> | <i>Bus.</i> | <i>Bus.</i> | <i>Bus.</i> | <i>Bus.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| New Jersey..... | 132 | 140 | 117 | 145 | 120 | 145 | 140 | 156 | 155 | 240 | 120 | 120 | 120 | 140 |
| Ohio..... | 109 | 95 | 115 | 105 | 133 | 120 | 125 | 163 | 163 | 210 | 150 | 140 | 135 | 145 |
| Indiana..... | 115 | 115 | 108 | 110 | 112 | 110 | 125 | 147 | 142 | 190 | 145 | 135 | 130 | 135 |
| Illinois..... | 100 | 108 | 88 | 110 | 103 | 98 | 102 | 138 | 139 | 190 | 135 | 115 | 110 | 130 |
| Iowa..... | 90 | 80 | 109 | 103 | 90 | 123 | 105 | 184 | 190 | 230 | 200 | 150 | 155 | 170 |
| Missouri..... | 103 | 100 | 95 | 112 | 112 | 105 | 110 | 130 | 125 | 165 | 130 | 120 | 105 | 120 |
| Kansas..... | 115 | 113 | 116 | 129 | 136 | 130 | 120 | 135 | 135 | 170 | 135 | 110 | 110 | 135 |
| Delaware..... | 124 | 130 | 110 | 139 | 110 | 140 | 145 | 113 | 120 | 180 | 65 | 70 | 80 | 90 |
| Maryland..... | 136 | 140 | 129 | 165 | 144 | 150 | 125 | 111 | 127 | 170 | 75 | 70 | 80 | 90 |
| Virginia..... | 122 | 120 | 108 | 125 | 135 | 144 | 149 | 100 | 110 | 130 | 160 | 85 | 70 | 80 |
| West Virginia..... | 114 | 110 | 92 | 110 | 110 | 102 | 120 | 158 | 141 | 200 | 160 | 140 | 140 | 160 |
| North Carolina..... | 102 | 92 | 88 | 90 | 114 | 98 | 117 | 100 | 104 | 120 | 100 | 80 | 85 | 90 |
| South Carolina..... | 88 | 68 | 55 | 80 | 100 | 86 | 115 | 103 | 104 | 147 | 100 | 80 | 85 | 80 |
| Georgia..... | 81 | 70 | 47 | 86 | 80 | 86 | 95 | 91 | 100 | 125 | 80 | 75 | 85 | 80 |
| Florida..... | 93 | 84 | 85 | 100 | 92 | 88 | 110 | 119 | 130 | 140 | 125 | 85 | 115 | 105 |
| Kentucky..... | 100 | 80 | 90 | 120 | 93 | 89 | 91 | 126 | 128 | 153 | 108 | 120 | 115 | 120 |
| Tennessee..... | 102 | 95 | 90 | 123 | 98 | 95 | 100 | 107 | 140 | 140 | 70 | 85 | 95 | 95 |
| Alabama..... | 92 | 73 | 70 | 100 | 98 | 93 | 103 | 101 | 125 | 125 | 85 | 85 | 90 | 90 |
| Mississippi..... | 96 | 51 | 96 | 104 | 112 | 110 | 130 | 108 | 173 | 100 | 95 | 80 | 90 | 80 |
| Arkansas..... | 96 | 81 | 85 | 108 | 116 | 90 | 66 | 104 | 127 | 125 | 95 | 80 | 90 | 115 |
| Louisiana..... | 86 | 50 | 80 | 90 | 98 | 90 | 93 | 106 | 158 | 115 | 90 | 70 | 85 | 85 |
| Oklahoma..... | 95 | 87 | 94 | 105 | 106 | 89 | 66 | 116 | 150 | 135 | 100 | 80 | 95 | 115 |
| Texas..... | 83 | 57 | 73 | 93 | 90 | 76 | 71 | 117 | 158 | 142 | 95 | 75 | 100 | 105 |
| New Mexico..... | 123 | 120 | 140 | 135 | 102 | 119 | 123 | 170 | 255 | 165 | 100 | 130 | 145 | 175 |
| Arizona..... | 138 | 125 | 130 | 150 | 120 | 142 | 140 | 203 | 238 | 210 | 155 | 200 | 200 | 220 |
| California..... | 116 | 94 | 112 | 97 | 90 | 96 | 99 | 156 | 218 | 170 | 110 | 115 | 110 | 145 |
| United States..... | 95.0 | 78.4 | 80.0 | 101.0 | 100.9 | 95.9 | 103.0 | 108.2 | 128.8 | 136.4 | 95.5 | 82.5 | 91.5 | 94.5 |

Bureau of Agricultural Economics. Yield figures are estimates of the crop-reporting board. Prices are based upon returns from crop reporters.

TABLE 273.—*Sweetpotatoes: Car-lot shipments by State of origin, 1920-1928*

Crop movement season ¹

| State | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 ² |
|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New Jersey ³ | 2,392 | 2,196 | 2,857 | 1,528 | 1,804 | 1,365 | 1,770 | 1,235 | 1,223 |
| Indiana..... | 44 | 62 | 65 | 75 | 103 | 236 | 284 | 209 | 231 |
| Delaware..... | 1,877 | 1,722 | 2,632 | 1,549 | 1,750 | 1,742 | 1,885 | 1,517 | 1,470 |
| Maryland..... | 1,363 | 1,286 | 1,750 | 1,123 | 1,155 | 1,520 | 2,283 | 2,256 | 2,106 |
| Virginia ³ | 4,839 | 5,300 | 6,633 | 5,374 | 5,213 | 4,750 | 6,501 | 6,618 | 6,478 |
| North Carolina ³ | 823 | 1,022 | 680 | 563 | 816 | 1,489 | 1,683 | 1,711 | 746 |
| South Carolina ³ | 56 | 135 | 236 | 154 | 120 | 231 | 162 | 276 | 130 |
| Georgia ³ | 1,030 | 1,400 | 781 | 610 | 1,018 | 674 | 678 | 667 | 227 |
| Florida..... | 95 | 112 | 123 | 62 | 175 | 242 | 185 | 159 | 69 |
| Kentucky ³ | 12 | 85 | 55 | 30 | 31 | 90 | 302 | 185 | 121 |
| Tennessee ³ | 924 | 1,578 | 1,495 | 726 | 1,137 | 2,592 | 4,972 | 3,587 | 2,918 |
| Alabama..... | 579 | 591 | 537 | 382 | 649 | 603 | 515 | 574 | 393 |
| Mississippi..... | 93 | 181 | 116 | 62 | 36 | 156 | 79 | 211 | 128 |
| Arkansas ³ | 568 | 584 | 240 | 263 | 371 | 476 | 548 | 392 | 316 |
| Louisiana ³ | 772 | 893 | 1,033 | 463 | 558 | 2,340 | 1,285 | 1,147 | 983 |
| Oklahoma..... | 91 | 147 | 85 | 110 | 107 | 216 | 268 | 284 | 255 |
| Texas..... | 632 | 759 | 974 | 535 | 221 | 474 | 702 | 1,284 | 716 |
| California..... | 856 | 1,000 | 982 | 684 | 466 | 1,161 | 1,186 | 805 | 767 |
| Other States ³ | 160 | 332 | 288 | 240 | 247 | 419 | 467 | 306 | 257 |
| Total ⁴ | 17,206 | 19,385 | 21,562 | 14,533 | 16,067 | 20,836 | 25,755 | 23,423 | 19,532 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop movement season extends from July 1 of 1 year through June of the following year.

² Preliminary.

³ Figures for certain States include shipments in July of succeeding crop year as follows: New Jersey, 1920, 15 cars, 1922, 3 cars; Indiana, 1926, 1 car; Virginia, 1928, 1 car; North Carolina, 1926, 3 cars, 1927, 10 cars; South Carolina, 1922, 1 car; Georgia, 1927, 2 cars; Kentucky, 1921, 1 car, 1928, 12 cars, 1928, 5 cars; Tennessee, 1921, 17 cars, 1921, 3 cars; 1925, 11 cars, 1926, 309 cars, 1927, 6 cars, 1928, 137 cars; Arkansas, 1921, 1 car, 1926, 1 car; Louisiana, 1926, 1 car; New Mexico, 1921, 5 cars; Tennessee, 1926, 19 cars in August.

⁴ Includes 3 cars in June 1923.

TABLE 274.—*Sweetpotatoes: Estimated average price per bushel received by producers, United States, 1910-1929*

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weighted average |
|---------------------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|------------------|
| Average: | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1910..... | 73.5 | 82.9 | 79.5 | 75.7 | 67.8 | 70.9 | 79.1 | 81.6 | 87.3 | 95.0 | 103.6 | 93.8 | 78.7 |
| 1911..... | 104.1 | 107.4 | 97.9 | 85.6 | 76.2 | 79.0 | 86.9 | 93.5 | 102.4 | 117.4 | 118.6 | 111.4 | 92.2 |
| 1912..... | 113.0 | 102.5 | 88.9 | 79.9 | 73.7 | 77.2 | 83.7 | 87.0 | 90.8 | 94.3 | 93.2 | 90.8 | 85.6 |
| 1913..... | 89.4 | 96.8 | 89.8 | 78.0 | 73.4 | 75.8 | 82.5 | 86.1 | 87.3 | 91.9 | 92.7 | 92.5 | 84.0 |
| 1914..... | 94.5 | 98.4 | 90.1 | 79.3 | 72.3 | 74.9 | 81.0 | 85.0 | 90.8 | 100.8 | 98.1 | 97.6 | 84.6 |
| 1915..... | 93.1 | 97.2 | 80.0 | 69.7 | 62.9 | 65.0 | 72.7 | 76.4 | 80.1 | 81.0 | 78.9 | 83.9 | 75.4 |
| 1916..... | 87.5 | 99.0 | 88.1 | 80.3 | 80.3 | 86.4 | 92.9 | 100.0 | 115.5 | 126.0 | 132.6 | 135.8 | 92.9 |
| 1917..... | 124.4 | 126.3 | 120.3 | 110.5 | 105.6 | 110.8 | 123.1 | 129.8 | 149.2 | 158.1 | 158.2 | 134.0 | 122.3 |
| 1918..... | 142.1 | 151.6 | 164.3 | 152.4 | 137.4 | 131.8 | 137.8 | 149.2 | 157.2 | 176.2 | 174.4 | 162.7 | 150.0 |
| 1919..... | 159.7 | 195.4 | 174.6 | 150.9 | 135.1 | 135.6 | 151.1 | 163.6 | 179.2 | 193.9 | 190.7 | 205.2 | 161.7 |
| 1920..... | 200.7 | 210.8 | 190.0 | 138.7 | 116.5 | 112.3 | 126.3 | 122.1 | 125.5 | 135.7 | 136.8 | 141.9 | 144.8 |
| 1921..... | 151.2 | 154.2 | 118.2 | 104.0 | 91.5 | 95.3 | 102.3 | 106.9 | 114.3 | 116.0 | 117.1 | 120.7 | 110.9 |
| 1922..... | 125.3 | 127.5 | 106.0 | 90.4 | 79.0 | 84.8 | 92.5 | 96.9 | 100.1 | 103.8 | 107.9 | 107.4 | 97.4 |
| 1923..... | 112.1 | 151.3 | 133.6 | 114.8 | 101.0 | 103.8 | 112.5 | 123.7 | 129.0 | 140.4 | 139.2 | 138.9 | 121.7 |
| 1924..... | 130.7 | 151.4 | 157.0 | 145.1 | 130.3 | 140.1 | 145.5 | 160.2 | 180.8 | 196.2 | 189.1 | 170.2 | 152.4 |
| 1925..... | 188.7 | 196.3 | 177.4 | 169.4 | 144.4 | 141.5 | 149.3 | 162.4 | 171.4 | 180.4 | 192.2 | 198.8 | 165.9 |
| 1926..... | 185.6 | 189.0 | 153.9 | 110.6 | 88.5 | 94.0 | 97.8 | 109.0 | 112.3 | 112.8 | 118.9 | 136.0 | 120.3 |
| 1927..... | 136.4 | 146.7 | 121.9 | 98.1 | 86.5 | 91.9 | 93.4 | 98.6 | 109.6 | 115.1 | 121.4 | 124.7 | 106.5 |
| 1928..... | 119.5 | 131.0 | 120.9 | 111.2 | 100.2 | 101.8 | 104.2 | 113.7 | 117.0 | 120.8 | 125.9 | 128.8 | 113.1 |
| 1929..... | 135.9 | 136.2 | 127.9 | 112.5 | 97.7 | 98.9 | | | | | | | |

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices, weighted by production of sweetpotatoes for each State, yearly price obtained by weighting monthly prices by average monthly marketings.

TABLE 275.—*Sweetpotatoes: Average l. c. l. price per bushel to jobbers, New York and Chicago, 1919-1929*

| Market, and season beginning August | Aug. ¹ | Sept. ¹ | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. ² | May ² |
|-------------------------------------|-------------------|--------------------|---------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|
| New York: | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 1919..... | | | 1.31 | 1.48 | 2.12 | 2.41 | 2.65 | 2.48 | 3.16 | 4.15 |
| 1920..... | 2.70 | 1.76 | 1.36 | 1.23 | 1.56 | 1.76 | 1.82 | 2.40 | 2.32 | 2.73 |
| 1921..... | 1.51 | 1.48 | 1.26 | 1.36 | 1.67 | 2.02 | 1.93 | 1.92 | 2.27 | 2.23 |
| 1922..... | | 1.00 | .70 | .73 | .96 | 1.03 | 1.01 | .94 | 1.39 | |
| 1923..... | | 1.16 | 1.20 | 1.95 | 2.51 | 2.94 | 3.38 | 3.62 | 3.98 | |
| 1924..... | | 1.98 | 1.47 | 1.88 | 2.47 | 2.75 | 2.74 | 2.63 | | |
| 1925..... | 1.53 | 1.70 | 1.68 | 1.70 | 2.23 | 2.61 | 2.59 | 2.96 | 3.42 | |
| 1926..... | 2.21 | 1.47 | .97 | .98 | 1.24 | 1.37 | 1.46 | 1.61 | 1.81 | 2.09 |
| 1927..... | 1.31 | 1.13 | .93 | 1.29 | 1.48 | 1.66 | 1.88 | 2.08 | 2.04 | |
| 1928..... | 1.57 | 1.29 | 1.05 | 1.31 | 1.62 | 1.88 | 2.14 | 2.32 | | |
| 1929..... | 1.60 | 1.34 | 1.09 | 1.28 | 1.60 | | | | | |
| Chicago: | | | | | | | | | | |
| 1919..... | | | 1.55 | 1.78 | 2.00 | 2.29 | 2.27 | 1.94 | 2.45 | 3.35 |
| 1920..... | 2.61 | 2.05 | 1.85 | 1.96 | 2.21 | 2.20 | 2.29 | 2.35 | 2.40 | 2.13 |
| 1921..... | 2.01 | 1.70 | 1.57 | 1.48 | 1.65 | 1.81 | 1.89 | 1.93 | 1.69 | 1.29 |
| 1922..... | | 1.44 | 1.00 | 1.22 | 1.26 | 1.43 | 1.44 | 1.47 | 1.62 | |
| 1923..... | | 1.67 | 1.52 | 2.03 | 2.73 | 3.09 | 3.31 | 3.76 | 4.04 | |
| 1924..... | | 2.29 | 1.88 | 2.33 | 2.80 | 2.92 | 3.26 | 2.94 | | |
| 1925..... | 2.04 | 2.04 | 2.02 | 2.25 | 2.42 | 2.37 | 2.29 | 2.40 | 2.98 | |
| 1926..... | 2.23 | 1.72 | 1.30 | 1.37 | 1.69 | 1.70 | 1.66 | 1.52 | 1.23 | 1.44 |
| 1927..... | 1.54 | 1.55 | 1.39 | 1.44 | ³ 1.68 | ³ 2.16 | ³ 2.51 | ³ 2.09 | ³ 2.22 | |
| 1928..... | 2.01 | 1.69 | 1.46 | 1.92 | ³ 2.30 | ³ 2.40 | ³ 2.49 | ³ 2.37 | | |
| 1929..... | 1.76 | 1.83 | 1.57 | ³ 1.64 | 1.78 | | | | | |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units or vice versa, in order to obtain comparability.

¹ Commodity reports began Sept. 30, 1919, Aug. 23, 1920 and 1921, Sept. 1, 1922, Sept. 18, 1923, Sept. 2, 1924 Aug. 25, 1925, Aug. 16, 1926, Aug. 19, 1927, Aug. 22, 1928, Aug. 19, 1929.

² Last commodity report of season May 28, 1920, May 20, 1921 and 1922, May 4, 1923, Apr. 15, 1924, Apr. 3, 1925, Apr. 16, 1926, Apr. 19, 1927, Apr. 3, 1928, Apr. 5, 1929. Subsequent prices for 1927 taken from miscellaneous reports.

³ Kila-dried.

STATISTICS OF FRUITS AND VEGETABLES

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TABLE 276.—*Tomatoes for consumption, fresh, commercial crop: Acreage production, and price per bushel, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per bushel | | | |
|-----------------------|--------------|--------------|--------------|--------------|----------------------|----------------------|----------------------|----------------------|--------------------------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| Fall: | | | | | | | | | | | | |
| Florida | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| Texas | 950 | 800 | 800 | 1,400 | 62 | 57 | 54 | 112 | 2.72 | 2.50 | 1.93 | 1.92 |
| Total | 950 | 800 | 1,200 | 5,400 | 62 | 57 | 74 | 352 | 2.72 | 2.50 | 2.36 | 2.06 |
| Early: | | | | | | | | | | | | |
| California (Imperial) | 1,000 | 1,300 | 1,200 | 1,400 | 113 | 95 | 146 | 134 | 3.05 | 2.00 | 2.06 | 1.85 |
| Florida— | | | | | | | | | | | | |
| East Coast South | 5,560 | 13,500 | 12,720 | 16,750 | 723 | 1,958 | 1,565 | 1,508 | 4.82 | 2.00 | 3.54 | 3.00 |
| Other | 15,140 | 16,300 | 16,140 | 16,220 | 1,225 | 1,646 | 1,501 | 1,217 | 4.07 | 2.03 | 3.54 | 3.00 |
| Texas (Lower Vy.) | 3,300 | 6,500 | 7,310 | 8,000 | 360 | 344 | 731 | 680 | 3.27 | 1.90 | 2.40 | 1.53 |
| Total | 25,000 | 37,600 | 37,370 | 42,380 | 2,422 | 4,043 | 3,943 | 3,539 | 4.13 | 2.00 | 3.27 | 2.67 |
| Second early: | | | | | | | | | | | | |
| Georgia | 1,850 | 2,000 | 2,090 | 210 | 111 | 163 | 142 | 27 | 2.50 | 1.36 | 1.76 | 2.30 |
| Louisiana | 1,690 | 1,980 | 1,690 | 1,770 | 128 | 178 | 166 | 158 | 1.81 | 1.60 | 1.27 | 1.25 |
| Mississippi | 14,200 | 15,360 | 16,800 | 14,800 | 1,406 | 1,997 | 1,344 | 1,658 | 3.28 | 2.40 | 1.75 | 2.19 |
| South Carolina | 3,450 | 2,000 | 2,600 | 2,860 | 386 | 160 | 322 | 429 | 3.33 | 1.51 | 1.87 | 2.43 |
| Texas (other) | 9,680 | 9,580 | 11,210 | 11,200 | 910 | 1,207 | 1,099 | 1,176 | 2.63 | 1.66 | 1.55 | 2.22 |
| Total | 30,870 | 31,016 | 34,390 | 30,840 | 2,941 | 3,705 | 3,073 | 3,448 | 2.99 | 2.01 | 1.67 | 2.15 |
| Intermediate: | | | | | | | | | | | | |
| Arkansas | 1,180 | 2,730 | 3,280 | 2,950 | 132 | 303 | 341 | 236 | 1.26 | 2.21 | .94 | 1.96 |
| Illinois (Union Co.) | 1,300 | 910 | 1,010 | 1,060 | 65 | 150 | 91 | 91 | 1.18 | 2.04 | 1.31 | 2.10 |
| Maryland | 3,220 | 4,000 | 4,700 | 5,000 | 206 | 628 | 451 | 950 | .91 | .80 | .84 | 1.15 |
| Missouri | 1,080 | 4,480 | 4,480 | 4,440 | 89 | 318 | 291 | 511 | .86 | .61 | .71 | 1.09 |
| New Jersey | 12,000 | 11,400 | 11,500 | 11,850 | 2,520 | 2,508 | 2,012 | 2,429 | .95 | 1.10 | 1.18 | 1.13 |
| Ohio (Wash. Co.) | 920 | 920 | 970 | 900 | 166 | 222 | 173 | 238 | 1.69 | 1.35 | 1.75 | 2.67 |
| Tennessee | 8,000 | 6,600 | 9,000 | 7,500 | 936 | 825 | 1,088 | 938 | 1.99 | 2.76 | 1.17 | 2.40 |
| Virginia | 1,500 | 1,200 | 1,360 | 1,500 | 188 | 150 | 196 | 255 | .63 | 2.25 | 1.93 | 1.05 |
| Total | 29,300 | 32,270 | 36,300 | 35,200 | 4,302 | 5,104 | 4,654 | 5,648 | 1.20 | 1.11 | 1.15 | 1.50 |
| Late: | | | | | | | | | | | | |
| California (other) | 12,090 | 21,550 | 20,650 | 18,950 | 2,007 | 1,789 | 1,735 | 1,421 | 1.19 | 1.16 | 1.32 | 1.15 |
| Colorado | 410 | 800 | 600 | 600 | 110 | 160 | 158 | 108 | .76 | .85 | .91 | .97 |
| Delaware | 290 | 180 | 160 | 190 | 20 | 36 | 14 | 36 | 1.00 | .75 | .72 | .54 |
| Illinois (other) | 2,290 | 2,750 | 2,750 | 2,890 | 396 | 432 | 336 | 332 | .99 | 1.51 | .74 | .85 |
| Indiana | 4,350 | 4,780 | 4,970 | 5,370 | 592 | 650 | 537 | 698 | .67 | .60 | .67 | .76 |
| Iowa | 570 | 450 | 190 | 220 | 67 | 72 | 24 | 31 | .50 | .51 | .83 | .98 |
| Kentucky | 1,040 | 1,630 | 1,710 | 1,620 | 115 | 186 | 130 | 224 | 1.39 | 1.18 | .82 | .90 |
| Michigan | 290 | 290 | 200 | 340 | 51 | 57 | 61 | 58 | 1.33 | .91 | .98 | 1.26 |
| New York | 1,740 | 2,640 | 2,640 | 2,900 | 311 | 631 | 560 | 667 | .85 | .55 | .99 | 1.05 |
| Ohio (other) | 890 | 1,110 | 840 | 880 | 152 | 179 | 176 | 163 | 1.16 | .78 | .93 | 1.15 |
| Oregon | | | 200 | 250 | | | 40 | 50 | | | 1.60 | 1.50 |
| Pennsylvania | 370 | 420 | 450 | 450 | 40 | 75 | 58 | 99 | .59 | .60 | .92 | 1.02 |
| Utah | 700 | 500 | 600 | 650 | 105 | 100 | 138 | 170 | .75 | .78 | .67 | .67 |
| Total | 24,910 | 37,100 | 36,050 | 35,310 | 3,966 | 4,367 | 3,967 | 4,057 | 1.03 | .96 | 1.05 | 1.00 |
| Total | 110,930 | 138,780 | 145,310 | 149,130 | 13,693 | 17,276 | 15,711 | 17,044 | 2.06 | 1.58 | 1.77 | 1.78 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 277.—*Tomatoes for manufacture, commercial crop: Acreage, production, and price per ton, by States, 1926-1929*

| Group and State | Acreage | | | | Production | | | | Price per unit of production | | | |
|-------------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|------------------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| New York..... | 9,850 | 10,540 | 12,500 | 13,600 | 49,200 | 70,600 | 73,800 | 85,700 | 15.30 | 14.92 | 15.20 | 15.70 |
| New Jersey..... | 32,000 | 30,000 | 33,000 | 33,000 | 153,600 | 156,000 | 118,800 | 214,500 | 20.40 | 18.00 | 18.50 | 19.00 |
| Pennsylvania..... | 3,370 | 3,740 | 3,600 | 3,420 | 10,100 | 18,700 | 13,000 | 13,700 | 13.40 | 14.24 | 14.50 | 15.00 |
| Ohio..... | 8,000 | 10,000 | 10,400 | 10,950 | 38,400 | 45,000 | 60,300 | 52,600 | 11.20 | 12.45 | 11.60 | 12.00 |
| Indiana..... | 49,990 | 42,990 | 49,870 | 59,840 | 175,000 | 163,400 | 149,600 | 251,300 | 12.60 | 13.06 | 12.90 | 13.20 |
| Illinois..... | 5,270 | 5,110 | 5,130 | 5,440 | 21,100 | 22,500 | 17,400 | 20,700 | 13.44 | 13.98 | 13.00 | 13.00 |
| Michigan..... | 1,800 | 1,800 | 1,660 | 1,090 | 9,000 | 9,900 | 9,600 | 9,000 | 11.80 | 12.13 | 11.00 | 12.00 |
| Iowa..... | 3,850 | 4,080 | 4,810 | 4,570 | 12,700 | 18,400 | 16,800 | 25,100 | 12.88 | 14.29 | 13.00 | 13.00 |
| Missouri..... | 25,620 | 19,440 | 18,700 | 20,940 | 64,000 | 38,900 | 33,700 | 60,700 | 11.85 | 12.87 | 12.60 | 13.00 |
| Delaware..... | 11,700 | 15,000 | 13,500 | 13,500 | 23,400 | 76,500 | 32,400 | 68,800 | 20.00 | 14.00 | 17.00 | 17.00 |
| Maryland..... | 37,000 | 34,410 | 23,910 | 27,500 | 88,800 | 151,400 | 66,900 | 140,200 | 13.90 | 14.28 | 15.70 | 16.10 |
| Virginia..... | 6,000 | 6,420 | 0,000 | 6,840 | 21,000 | 25,700 | 14,400 | 26,000 | 12.73 | 13.75 | 13.20 | 14.90 |
| Kentucky..... | 6,950 | 6,530 | 5,500 | 6,820 | 20,800 | 20,900 | 11,600 | 26,600 | 12.25 | 13.08 | 12.60 | 12.60 |
| Tennessee..... | 8,200 | 8,450 | 10,220 | 9,200 | 24,600 | 24,500 | 18,400 | 23,000 | 13.42 | 13.95 | 12.00 | 12.10 |
| Arkansas..... | 11,630 | 17,820 | 19,600 | 22,600 | 29,100 | 53,500 | 43,100 | 61,000 | 11.86 | 12.76 | 12.60 | 14.00 |
| Colorado..... | 2,350 | 2,000 | 1,600 | 1,920 | 17,600 | 14,000 | 11,800 | 16,700 | 12.00 | 12.00 | 11.00 | 11.00 |
| Utah..... | 2,630 | 5,200 | 5,650 | 6,180 | 18,400 | 48,400 | 65,500 | 56,900 | 10.00 | 11.00 | 11.00 | 11.00 |
| California..... | 32,250 | 28,760 | 24,700 | 32,450 | 206,400 | 178,300 | 182,800 | 201,200 | 15.61 | 15.00 | 14.60 | 15.20 |
| Other States..... | 3,040 | 3,310 | 4,070 | 4,480 | 9,100 | 7,600 | 14,200 | 15,200 | 13.60 | 14.43 | 13.20 | 13.40 |
| Total..... | 261,600 | 255,600 | 254,402 | 285,240 | 992,300 | 1,144,200 | 954,100 | 1,368,900 | 14.72 | 14.32 | 14.17 | 14.92 |

Bureau of Agricultural Economics. Estimates based upon returns from canning establishments.

TABLE 278.—*Tomatoes: Car-lot shipments by State of origin, 1920-1929*

| State | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 ¹ |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 1,945 | 1,073 | 1,902 | 1,261 | 954 | 1,024 | 656 | 951 | 1,112 | 829 |
| New Jersey..... | 2,798 | 2,121 | 1,930 | 1,648 | 2,150 | 1,907 | 2,006 | 1,329 | 678 | 662 |
| Ohio..... | 450 | 411 | 558 | 956 | 1,035 | 1,286 | 1,065 | 1,125 | 926 | 995 |
| Indiana..... | 1,265 | 552 | 1,332 | 1,185 | 1,479 | 1,889 | 1,514 | 1,132 | 799 | 1,601 |
| Illinois..... | 450 | 155 | 220 | 250 | 230 | 539 | 422 | 270 | 240 | 232 |
| Maryland..... | 194 | 110 | 242 | 271 | 66 | 313 | 259 | 586 | 613 | 665 |
| Virginia..... | 188 | 91 | 83 | 44 | 167 | 379 | 454 | 360 | 277 | 488 |
| South Carolina..... | | 59 | 145 | 431 | 421 | 568 | 449 | 187 | 161 | 348 |
| Georgia..... | 1 | 4 | 23 | 18 | 176 | 85 | 169 | 82 | 73 | 62 |
| Florida ² | 4,192 | 5,785 | 10,245 | 9,760 | 9,140 | 7,188 | 4,351 | 9,737 | 8,491 | 8,038 |
| Kentucky..... | 468 | 341 | 153 | 121 | 546 | 498 | 300 | 203 | 42 | 244 |
| Arkansas..... | 11 | 23 | 47 | 0 | 38 | 104 | 261 | 240 | 389 | 298 |
| Tennessee..... | 805 | 370 | 920 | 501 | 985 | 1,393 | 2,374 | 2,016 | 2,759 | 2,317 |
| Mississippi..... | 1,393 | 1,945 | 3,441 | 2,144 | 3,776 | 3,140 | 3,492 | 4,849 | 3,230 | 4,099 |
| Texas ³ | 1,393 | 2,025 | 1,893 | 1,084 | 1,694 | 2,398 | 2,890 | 3,393 | 4,435 | 5,317 |
| Utah..... | 261 | 100 | 378 | 360 | 380 | 1,457 | 272 | 883 | 899 | 682 |
| California ³ | 2,004 | 1,819 | 2,349 | 3,293 | 2,789 | 2,961 | 4,440 | 4,620 | 4,475 | 4,211 |
| Other States..... | 576 | 431 | 847 | 622 | 804 | 1,116 | 674 | 701 | 796 | 783 |
| Total ^{2,3} | 18,394 | 17,415 | 20,717 | 23,967 | 26,830 | 28,254 | 26,068 | 32,664 | 30,395 | 31,901 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Preliminary.² Figures for Florida include cars moved in preceding calendar year as follows: 1920, 14 cars in November, 34 cars in December; 1922, 10 cars in December; 1923, 26 cars in December; 1924, 2 cars in November, 55 cars in December; 1925, 14 cars in November, 31 cars in December; 1926, 7 cars in November, 13 cars in December; 1927, 1 car in December; 1928, 28 cars in November, 201 cars in December; 1929, 104 cars in November, 392 cars in December.³ Figures include cars in following calendar year as follows: California, 1922, 3 cars in January; 1924, 1 car in January; 1925, 1 car in January; 1928, 1 car in January; Texas, 1922, 5 cars in January, and 2 cars in February; 1925, 8 cars in January; 1926, 15 cars in January; 1927, 1 car in January; 1928, 1 car in January.

TABLE 279.—Tomatoes: United States commercial production, imports and exports, annual, 1923-1929

| Year | Commercial production | | Imports, year beginning July 1 | | | | Exports, year beginning July 1 | |
|-----------|-----------------------|-----------------|--------------------------------|--------------|---------------------|--------------|--------------------------------|-------------------|
| | For table | For manufacture | Fresh | Canned | Other-wise prepared | Paste | Canned | Catsup and sauces |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1923..... | 973, 200 | 2, 244, 800 | 150, 838 | 30, 946 | 11, 341 | 14, 164 | 9, 152 | 13, 560 |
| 1924..... | 1, 057, 000 | 2, 317, 000 | 69, 216 | 73, 902 | 9, 443 | 17, 382 | 5, 203 | 5, 520 |
| 1925..... | 1, 098, 800 | 3, 544, 400 | 82, 448 | 84, 897 | (2) | 18, 179 | 5, 794 | 5, 006 |
| 1926..... | 767, 000 | 1, 984, 600 | 124, 489 | 80, 257 | ----- | 15, 642 | 7, 504 | 7, 556 |
| 1927..... | 967, 600 | 2, 288, 400 | 113, 357 | 107, 782 | ----- | 12, 064 | 6, 725 | 8, 584 |
| 1928..... | 875, 200 | 1, 917, 000 | 128, 606 | 8, 952 | ----- | 9, 539 | 4, 009 | 13, 066 |
| 1929..... | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Production figures based upon returns from crop reporters; imports and exports compiled from Monthly Summary of Foreign Commerce of the United States, June issues.

¹ January-June, 1924.

² From 1926 on included with "tomatoes, canned."

TABLE 280.—Tomatoes, canned: Pack¹ in the United States, 1917-1929

| State | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases |
| New York..... | 553 | 396 | 437 | 515 | 214 | 340 | 266 | 325 | 389 | 302 | 300 | 261 | 329 |
| New Jersey..... | 380 | 667 | 60 | 517 | 116 | 337 | 412 | 186 | 418 | 204 | 254 | 95 | 257 |
| Pennsylvania..... | 2,488 | 2,441 | 2,384 | 2,680 | 2,186 | 2,044 | 258 | 150 | 338 | 118 | 167 | 95 | 122 |
| Ohio..... | 107 | 357 | 172 | 142 | 71 | 179 | 174 | 133 | 179 | 120 | 189 | 124 | 153 |
| Indiana..... | 398 | 968 | 876 | 778 | 530 | 1,312 | 717 | 1,050 | 1,955 | 900 | 1,131 | 613 | 1,134 |
| Missouri..... | 704 | 353 | 439 | 715 | 136 | 775 | 839 | 871 | 1,836 | 895 | 605 | 396 | 622 |
| Delaware..... | 1,381 | 879 | 189 | 553 | 176 | 590 | 1,216 | 803 | 1,272 | 228 | 827 | 325 | 851 |
| Maryland..... | 5,934 | 6,649 | 2,529 | 3,347 | 1,656 | 3,205 | 5,722 | 3,825 | 6,175 | 1,901 | 3,671 | 1,720 | 4,050 |
| Virginia ² | 1,170 | 1,547 | 953 | 1,162 | 217 | 891 | 963 | 1,116 | 1,138 | 572 | 1,059 | 466 | 918 |
| Kentucky ³ | ----- | ----- | ----- | ----- | ----- | ----- | 59 | 136 | 275 | 223 | 253 | 111 | 167 |
| Tennessee ⁴ | ----- | ----- | ----- | ----- | ----- | ----- | 176 | 386 | 382 | 280 | 368 | 160 | 297 |
| Arkansas ⁴ | ----- | ----- | ----- | ----- | ----- | ----- | 270 | 768 | 1,168 | 558 | 678 | 613 | 769 |
| Colorado ⁵ | 213 | 306 | 290 | 218 | 62 | 168 | 182 | 180 | 309 | 183 | 127 | 158 | 195 |
| Utah..... | 513 | 953 | 594 | 444 | 132 | 664 | 584 | 417 | 1,353 | 235 | 792 | 924 | 768 |
| California..... | 2,603 | 1,790 | 3,052 | 1,773 | 339 | 1,701 | 2,397 | 1,767 | 1,839 | 2,347 | 2,257 | 1,991 | 2,812 |
| Other States..... | 632 | 576 | 835 | 524 | 182 | 732 | 437 | 406 | 744 | 389 | 459 | 487 | 701 |
| United States..... | 15, 076 | 15, 882 | 10, 810 | 11, 368 | 4, 017 | 11, 538 | 14, 672 | 12, 519 | 19, 770 | 9, 455 | 13, 137 | 8, 539 | 14, 145 |

Bureau of Agricultural Economics. Compiled from National Canners' Association, 1917-1926; Census of Manufactures 1927-1928; 1929, American Grocer, Feb. 19, 1930.

¹ Stated in cases of 24 No. 3 cans.

² Previous to 1923, Pennsylvania, Kentucky, and Tennessee composed one group.

³ Includes West Virginia.

⁴ Previous to 1923, included in "Other States."

⁵ Includes Washington.

TABLE 281.—*Watermelons, commercial crop: Acreage, production, and price per 1,000 melons, by States, 1926-1929*

| State | Acreage | | | | Production | | | | Seasonal farm price per 1,000 melons | | | |
|----------------------------|--------------|--------------|--------------|--------------|---------------------|---------------------|---------------------|---------------------|--------------------------------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| Early: | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 melons</i> | <i>1,000 melons</i> | <i>1,000 melons</i> | <i>1,000 melons</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> | <i>Dol-lars</i> |
| California (Imperial)..... | 6,000 | 5,500 | 8,000 | 8,900 | 4,560 | 3,597 | 4,912 | 6,319 | 100 | 120 | 136 | 143 |
| Florida..... | 24,150 | 29,420 | 37,840 | 36,390 | 10,843 | 8,826 | 10,406 | 10,480 | 255 | 286 | 200 | 278 |
| Total..... | 30,150 | 34,920 | 45,840 | 45,290 | 15,403 | 12,423 | 15,318 | 16,799 | 209 | 238 | 253 | 227 |
| Second Early: | | | | | | | | | | | | |
| Alabama..... | 11,030 | 9,820 | 9,330 | 7,460 | 3,254 | 2,946 | 2,332 | 2,387 | 93 | 175 | 151 | 93 |
| Arizona..... | 1,200 | 1,200 | 1,150 | 1,250 | 402 | 420 | 391 | 400 | 156 | 287 | 250 | 200 |
| Georgia..... | 53,600 | 55,220 | 62,950 | 9,240 | 20,958 | 17,946 | 18,885 | 23,542 | 121 | 161 | 141 | 170 |
| Mississippi..... | 1,240 | 1,300 | 1,400 | 1,330 | 217 | 390 | 392 | 466 | 89 | 140 | 150 | 162 |
| North Carolina..... | 4,880 | 5,610 | 5,610 | 5,440 | 1,484 | 2,014 | 1,083 | 979 | 77 | 149 | 136 | 175 |
| South Carolina..... | 12,720 | 12,470 | 14,340 | 11,330 | 5,215 | 4,240 | 4,302 | 3,739 | 88 | 168 | 94 | 175 |
| Texas..... | 34,900 | 29,660 | 35,080 | 29,640 | 6,980 | 8,156 | 8,770 | 5,335 | 222 | 165 | 186 | 156 |
| Total..... | 119,570 | 115,280 | 129,860 | 125,690 | 38,510 | 36,112 | 36,755 | 36,848 | 131 | 164 | 148 | 151 |
| Late: | | | | | | | | | | | | |
| Arkansas..... | 2,700 | 2,200 | 2,700 | 2,190 | 540 | 594 | 810 | 815 | 121 | 186 | 135 | 172 |
| California, (other)..... | 6,820 | 4,280 | 4,400 | 5,020 | 3,008 | 1,644 | 3,379 | 3,785 | 112 | 139 | 133 | 115 |
| Colorado..... | 300 | 700 | 570 | 500 | 108 | 105 | 182 | 150 | 95 | 242 | 150 | 165 |
| Delaware..... | 2,000 | 980 | 880 | 740 | 800 | 98 | 132 | 222 | 105 | 105 | 158 | 200 |
| Illinois..... | 3,200 | 2,880 | 3,170 | 3,800 | 816 | 734 | 824 | 1,330 | 86 | 269 | 162 | 190 |
| Indiana..... | 3,440 | 2,720 | 3,240 | 3,200 | 980 | 778 | 1,134 | 2,342 | 118 | 350 | 146 | 180 |
| Iowa..... | 1,640 | 1,380 | 1,610 | 1,580 | 420 | 442 | 523 | 291 | 84 | 218 | 157 | 165 |
| Maryland..... | 1,800 | 1,240 | 1,180 | 1,000 | 648 | 446 | 401 | 275 | 76 | 200 | 125 | 177 |
| Missouri..... | 17,500 | 8,000 | 5,000 | 5,700 | 5,688 | 1,800 | 1,430 | 1,550 | 114 | 201 | 154 | 173 |
| New Jersey..... | 2,200 | 1,900 | 2,000 | 2,200 | 462 | 380 | 500 | 1,100 | 210 | 250 | 270 | 300 |
| Oklahoma..... | 4,000 | 3,000 | 3,270 | 3,110 | 1,300 | 1,146 | 818 | 871 | 186 | 175 | 155 | 175 |
| Virginia..... | 3,100 | 2,320 | 2,320 | 2,440 | 781 | 731 | 784 | 878 | 141 | 144 | 165 | 179 |
| Washington..... | 640 | 710 | 890 | 1,100 | 234 | 249 | 305 | 360 | 118 | 225 | 202 | 319 |
| Total..... | 49,340 | 32,310 | 31,230 | 32,580 | 15,785 | 9,147 | 11,222 | 13,060 | 120 | 202 | 152 | 175 |
| Grand total..... | 199,060 | 182,510 | 206,930 | 203,560 | 69,698 | 57,682 | 63,295 | 67,616 | 146 | 186 | 174 | 175 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

STATISTICS OF FRUITS AND VEGETABLES

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TABLE 282.—*Watermelons: Car-lot shipments by State of origin, 1923-1929*

| State and year | Crop movement season ¹ | | | | | | | | | |
|-------------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
| Florida: | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| 1923..... | | 272 | 5,964 | 2,042 | 17 | | | | | 9,105 |
| 1929 ² | 36 | 3,353 | 6,982 | 106 | | | | | | 10,477 |
| California: | | | | | | | | | | |
| 1928..... | | 233 | 2,171 | 2,491 | 490 | 186 | 18 | | | 5,593 |
| 1929 ² | | 23 | 2,032 | 2,980 | 1,121 | 185 | 21 | | | 6,362 |
| Texas: | | | | | | | | | | |
| 1928..... | | | 2,135 | 3,072 | 1,216 | 25 | 2 | | | 6,450 |
| 1929 ² | | 120 | 1,898 | 1,674 | 731 | 32 | | | | 4,455 |
| Georgia: | | | | | | | | | | |
| 1928..... | | | 81 | 12,583 | 4,824 | 70 | | | | 17,558 |
| 1929 ² | | | 10,606 | 9,500 | 1,691 | 40 | | | | 21,827 |
| Alabama: | | | | | | | | | | |
| 1928..... | | | 2 | 510 | 193 | 64 | | | | 769 |
| 1929 ² | | | 230 | 303 | 133 | 59 | | | | 725 |
| South Carolina: | | | | | | | | | | |
| 1928..... | | | | 3,011 | 810 | 1 | | | | 3,822 |
| 1929 ² | | | 162 | 2,907 | 174 | 4 | | | | 3,337 |
| North Carolina: | | | | | | | | | | |
| 1928..... | | | | 126 | 1,126 | | | | | 1,252 |
| 1929 ² | | | | 138 | 601 | | | | | 739 |
| Missouri: | | | | | | | | | | |
| 1928..... | | | | | 738 | 113 | | | | 851 |
| 1929 ² | | | | 12 | 938 | 140 | | | | 1,090 |
| Other States: | | | | | | | | | | |
| 1928..... | | 3 | 57 | 202 | 1,994 | 724 | 30 | 1 | | 3,011 |
| 1929 ² | | | 109 | 416 | 2,135 | 558 | 9 | | | 3,227 |
| Total: | | | | | | | | | | |
| 1920..... | | 17 | 5,475 | 18,057 | 11,401 | 2,230 | 49 | 22 | 63 | 37,314 |
| 1921..... | 7 | 1,133 | 11,061 | 19,229 | 12,256 | 1,983 | 80 | | | 45,749 |
| 1922..... | 8 | 3,566 | 15,291 | 18,003 | 9,061 | 1,616 | 80 | | | 47,625 |
| 1923..... | 3 | 792 | 6,176 | 15,351 | 8,583 | 2,045 | 159 | 2 | | 33,081 |
| 1924..... | ³ 2 | 65 | 6,602 | 26,024 | 10,470 | 2,458 | 120 | 4 | | 45,745 |
| 1925..... | | 605 | 11,767 | 17,814 | 11,324 | 2,390 | 82 | 2 | | 44,184 |
| 1926..... | | 443 | 11,424 | 29,873 | 11,497 | 1,861 | 28 | | | 55,126 |
| 1927..... | 4 | 1,713 | 15,255 | 20,898 | 6,262 | 1,201 | 67 | | | 43,460 |
| 1928..... | | 508 | 10,410 | 24,937 | 11,408 | 1,183 | 50 | 1 | | 48,197 |
| 1929 ² | 36 | 3,490 | 22,019 | 18,126 | 7,524 | 1,018 | 30 | | | 52,244 |

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. See 1927 Yearbook, p. 901, for data for earlier years.

¹ Crop movement season extends from Apr. 1 through December of a given year.

² Preliminary.

³ Reported as shipped in January.

TABLE 283.—*Watermelons, Tom Watson: Price per car to jobbers, Chicago and New York, 1924-1929* ¹

| Market and season ² | June | July | August | Market and season ² | June | July | August |
|--------------------------------|----------------|----------------|---------------------|--------------------------------|---------------------|---------------------|---------------------|
| Chicago: | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | New York: | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| 1924..... | 576.00 | 249.00 | 291.00 | 1924..... | 474.00 | ³ 270.00 | ² 273.00 |
| 1925..... | 576.00 | 362.00 | ⁴ 211.00 | 1925..... | ³ 512.00 | ³ 311.00 | 202.00 |
| 1926..... | 623.00 | 281.00 | ⁴ 202.00 | 1926..... | 460.00 | 248.00 | 190.00 |
| 1927..... | 471.00 | 289.00 | | 1927..... | 435.00 | 289.00 | 237.00 |
| 1928..... | 445.00 | 301.00 | 252.00 | 1928..... | 378.00 | 262.00 | 216.00 |
| 1929..... | 365.00 | 339.00 | | 1929..... | 368.00 | 278.00 | ⁴ 234.00 |

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simply averages of daily range of selling prices.

¹ Quotations are for Southeastern, 22-26 pound average.

² Quotations began June 6, 1924; May 28, 1925; May 28, 1926; May 16, 1927; May 21, 1928; May 9, 1929. Last reported quotations of season Aug. 30, 1924; Sept. 5, 1925; Sept. 1, 1926; Aug. 26, 1927; Aug. 24, 1928; Aug. 31, 1929.

³ Auction sales.

⁴ Thurmond Gray.

TABLE 284.—Truck crops, commercial (for consumption, fresh, and for canning and manufacture):¹ Total acreage and value, by States, average 1923–1927, annual 1928 and 1929

| State | Acreage | | | Farm value ² | | |
|----------------------------------|----------------------|--------------|--------------|--------------------------|--------------------------|--------------------------|
| | Average 1923–1927 | 1928 | 1929 | Average 1923–1927 | 1928 | 1929 |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> |
| Maine..... | 14,860 | 12,840 | 17,580 | 1,226 | 952 | 1,411 |
| New Hampshire..... | 1,090 | 1,110 | 1,320 | 68 | 62 | 79 |
| Vermont..... | 2,400 | 1,940 | 2,370 | 114 | 86 | 113 |
| Massachusetts..... | 3,890 | 5,080 | 4,310 | 1,350 | 1,350 | 1,371 |
| New York..... | 151,030 | 151,110 | 158,940 | 21,285 | 21,640 | 21,855 |
| New Jersey..... | 143,360 | 159,020 | 154,840 | 25,067 | 21,004 | 27,594 |
| Pennsylvania..... | 17,540 | 17,350 | 17,710 | 2,551 | 2,390 | 2,198 |
| North Atlantic..... | 334,170 | 348,450 | 357,070 | 51,661 | 47,484 | 54,621 |
| Ohio..... | 58,670 | 60,610 | 63,490 | 5,890 | 5,077 | 5,089 |
| Indiana..... | 116,430 | 118,770 | 130,230 | 8,177 | 8,277 | 8,216 |
| Illinois..... | 89,160 | 93,300 | 100,320 | 5,976 | 4,731 | 5,816 |
| Michigan..... | 74,040 | 65,590 | 66,270 | 6,162 | 7,250 | 6,042 |
| Wisconsin..... | 147,970 | 147,600 | 163,250 | 9,249 | 10,805 | 10,724 |
| Minnesota..... | 37,830 | 48,720 | 65,810 | 1,523 | 2,550 | 2,636 |
| Iowa..... | 65,040 | 54,480 | 58,020 | 3,446 | 2,691 | 3,179 |
| Missouri..... | 64,350 | 64,570 | 61,110 | 0,100 | 4,885 | 0,127 |
| Nebraska..... | 8,820 | 7,370 | 7,490 | 340 | 234 | 423 |
| Kansas..... | 17,800 | 19,570 | 14,300 | 2,243 | 993 | 1,800 |
| North Central..... | 680,200 | 680,580 | 730,290 | 49,105 | 47,493 | 50,152 |
| Delaware..... | 34,690 | 33,050 | 33,120 | 3,038 | 2,616 | 3,964 |
| Maryland..... | 138,380 | 131,530 | 135,790 | 14,066 | 8,200 | 13,624 |
| Virginia..... | 138,230 | 136,580 | 123,960 | 23,031 | 14,478 | 21,487 |
| North Carolina..... | 53,030 | 79,430 | 53,890 | 9,837 | 7,970 | 8,237 |
| South Carolina..... | 54,110 | 68,150 | 56,420 | 9,229 | 6,549 | 9,107 |
| Georgia..... | 61,700 | 81,780 | 86,590 | 4,084 | 4,033 | 5,221 |
| Florida..... | 134,110 | 159,240 | 156,860 | 36,417 | 37,480 | 36,051 |
| South Atlantic..... | 614,250 | 689,760 | 646,630 | 100,303 | 81,326 | 97,691 |
| Kentucky..... | 21,500 | 22,330 | 19,710 | 3,046 | 2,060 | 2,725 |
| Tennessee..... | 37,370 | 49,760 | 45,830 | 5,867 | 4,689 | 5,650 |
| Alabama..... | 30,880 | 38,490 | 28,010 | 3,702 | 4,593 | 3,635 |
| Mississippi..... | 29,130 | 35,810 | 33,360 | 6,017 | 4,636 | 6,371 |
| Arkansas..... | 45,160 | 66,550 | 61,710 | 5,138 | 4,543 | 6,401 |
| Louisiana..... | 63,480 | 102,250 | 97,510 | 10,835 | 15,306 | 15,039 |
| Oklahoma..... | 10,020 | 22,320 | 17,510 | 1,949 | 784 | 1,408 |
| Texas..... | 109,390 | 163,110 | 163,300 | 15,465 | 18,409 | 19,024 |
| South Central..... | 352,930 | 500,620 | 466,940 | 52,020 | 55,020 | 58,253 |
| Montana..... | — | 3,500 | 4,200 | — | 189 | 195 |
| Idaho..... | 2,730 | 1,360 | 1,540 | 587 | 931 | 444 |
| Wyoming..... | 190 | 40 | 40 | 53 | 5 | 4 |
| Colorado..... | 40,610 | 45,030 | 57,420 | 6,725 | 7,193 | 8,593 |
| New Mexico..... | 3,300 | 2,330 | 2,500 | 712 | 446 | 357 |
| Arizona..... | 15,150 | 37,850 | 40,850 | 4,041 | 6,907 | 10,418 |
| Utah..... | 16,590 | 21,510 | 23,960 | 1,911 | 3,053 | 2,532 |
| Nevada..... | 830 | 420 | 380 | 139 | 91 | 119 |
| Washington..... | 14,230 | 19,160 | 20,620 | 3,928 | 4,813 | 5,028 |
| Oregon..... | 12,520 | 15,380 | 16,410 | 2,923 | 3,872 | 3,424 |
| California..... | 270,090 | 356,620 | 387,050 | 59,450 | 72,162 | 76,751 |
| Far Western..... | 376,240 | 503,200 | 554,970 | 80,470 | 99,662 | 107,865 |
| Miscellaneous ³ | 22,700 | 20,470 | 22,500 | 1,238 | 979 | 1,154 |
| United States..... | 2,380,488 | 2,743,080 | 2,778,400 | 334,825 | 331,964 | 369,736 |

Bureau of Agricultural Economics.

¹ Crops grown for consumption, fresh: Asparagus, snap beans, cabbage, cantaloupes, carrots, cauliflowers, celery, cucumbers, eggplant, lettuce, onions, green peas, peppers, early Irish potatoes, spinach, strawberries, tomatoes, watermelons; and those grown for canning and manufacture: asparagus, snap beans, cabbage (kraut), sweet corn, cucumbers (pickles), green peas, pimientos (since 1926), spinach, tomatoes.

² Based upon average seasonal farm prices.

³ Consists of minor acreages of canning crops in various States.

STATISTICS OF FRUITS AND VEGETABLES

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TABLE 285.—*Truck crops, commercial (for consumption, fresh, and for canning and manufacture): Acreage, production and value of specified crops, United States, 1923-1929*

ACREAGE

| Crop | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> |
| Asparagus..... | 42,050 | 50,560 | 65,530 | 84,980 | 90,500 | 96,710 | 98,900 |
| Beans, snap..... | 61,420 | 88,020 | 107,170 | 100,460 | 110,220 | 134,370 | 134,420 |
| Cabbage..... | 104,880 | 119,120 | 119,970 | 129,330 | 143,790 | 137,170 | 157,220 |
| Cantaloupes..... | 84,160 | 95,250 | 93,260 | 101,690 | 105,780 | 100,660 | 106,730 |
| Carrots..... | 9,570 | 11,480 | 15,760 | 19,000 | 26,800 | 27,540 | 30,570 |
| Cauliflower..... | 11,700 | 13,100 | 15,780 | 22,170 | 18,020 | 21,430 | 25,360 |
| Celery..... | 20,660 | 22,550 | 22,910 | 21,530 | 24,550 | 27,040 | 28,730 |
| Corn, sweet..... | 252,590 | 302,790 | 303,910 | 317,310 | 225,350 | 305,060 | 331,070 |
| Cucumbers..... | 91,900 | 122,560 | 140,480 | 119,450 | 93,500 | 110,020 | 111,540 |
| Eggplant..... | 2,470 | 2,690 | 3,490 | 3,260 | 3,090 | 3,890 | 3,430 |
| Lettuce..... | 57,790 | 68,660 | 80,030 | 105,590 | 123,010 | 124,630 | 141,430 |
| Onions..... | 61,940 | 65,090 | 65,280 | 75,780 | 77,580 | 80,020 | 86,570 |
| Peas, green..... | 212,250 | 254,270 | 260,310 | 261,840 | 221,000 | 266,000 | 296,810 |
| Peppers..... | 8,210 | 11,190 | 13,780 | 15,560 | 14,770 | 17,890 | 17,810 |
| Pimientos..... | | | | 5,110 | 7,040 | 8,850 | 9,060 |
| Potatoes, early..... | 281,740 | 338,450 | 302,780 | 323,800 | 348,230 | 401,370 | 289,490 |
| Spinach..... | 31,070 | 34,140 | 44,360 | 51,200 | 55,250 | 65,350 | 72,570 |
| Strawberries..... | 148,360 | 176,470 | 144,740 | 152,040 | 191,250 | 206,920 | 198,560 |
| Tomatoes..... | 379,280 | 441,790 | 483,750 | 372,430 | 394,380 | 399,730 | 434,370 |
| Watermelons..... | 157,350 | 184,830 | 173,710 | 199,060 | 182,510 | 206,930 | 203,560 |
| Total..... | 2,019,450 | 2,403,010 | 2,553,000 | 2,472,860 | 2,454,120 | 2,743,080 | 2,778,400 |

PRODUCTION

| Crop | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|-----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> |
| Asparagus..... crates..... | 5,846 | 5,524 | 6,276 | 7,813 | 7,861 | 9,433 | 9,687 |
| Beans, snap..... tons..... | 100 | 118 | 152 | 120 | 125 | 146 | 167 |
| Cabbage..... do..... | 806 | 1,068 | 937 | 1,036 | 1,221 | 984 | 1,069 |
| Cantaloupes..... crates..... | 11,745 | 13,834 | 14,553 | 14,393 | 15,014 | 15,416 | 16,799 |
| Carrots..... bushels..... | 3,119 | 4,084 | 4,800 | 5,523 | 7,760 | 7,524 | 10,161 |
| Cauliflower..... crates..... | 3,367 | 2,763 | 3,493 | 5,581 | 4,173 | 5,631 | 6,450 |
| Celery..... do..... | 5,684 | 6,509 | 6,702 | 5,767 | 7,585 | 7,624 | 8,686 |
| Corn, sweet..... tons..... | 850 | 528 | 1,014 | 816 | 414 | 693 | 639 |
| Cucumbers..... bushels..... | 7,071 | 7,677 | 12,439 | 9,028 | 8,294 | 8,556 | 8,644 |
| Eggplant..... do..... | 850 | 794 | 904 | 791 | 814 | 896 | 713 |
| Lettuce..... crates..... | 11,006 | 13,219 | 16,061 | 17,144 | 19,369 | 18,382 | 20,325 |
| Onions..... bushels..... | 17,306 | 19,242 | 19,756 | 21,574 | 23,797 | 20,454 | 25,867 |
| Peas, green..... tons..... | 188 | 274 | 242 | 240 | 242 | 278 | 288 |
| Peppers..... bushels..... | 3,010 | 3,681 | 3,459 | 3,012 | 3,536 | 4,466 | 4,103 |
| Pimientos..... tons..... | | | | 13 | 16 | 16 | 20 |
| Potatoes, early..... bushels..... | 26,244 | 44,100 | 30,889 | 36,625 | 44,827 | 55,475 | 35,613 |
| Spinach..... tons..... | 94 | 107 | 105 | 128 | 141 | 141 | 189 |
| Strawberries..... quarts..... | 256,409 | 318,121 | 228,675 | 276,385 | 320,991 | 334,331 | 331,441 |
| Tomatoes..... tons..... | 1,608 | 1,686 | 2,322 | 1,375 | 1,628 | 1,394 | 1,846 |
| Watermelons..... number..... | 42,734 | 57,086 | 56,498 | 69,698 | 57,682 | 63,295 | 67,616 |

FARM VALUE

| Crop | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> |
| Asparagus..... | 15,081 | 9,589 | 10,137 | 14,188 | 13,697 | 14,565 | 16,808 |
| Beans, snap..... | 13,803 | 14,655 | 15,949 | 14,960 | 14,527 | 15,012 | 16,975 |
| Cabbage..... | 17,883 | 17,688 | 16,787 | 18,489 | 19,359 | 23,163 | 21,254 |
| Cantaloupes..... | 23,501 | 19,618 | 21,273 | 18,520 | 22,425 | 20,099 | 22,350 |
| Carrots..... | 2,624 | 3,430 | 2,902 | 3,533 | 4,366 | 5,122 | 5,917 |
| Cauliflower..... | 5,344 | 3,763 | 4,250 | 5,485 | 5,207 | 5,010 | 5,118 |
| Celery..... | 11,277 | 12,740 | 11,796 | 10,652 | 12,505 | 14,367 | 14,371 |
| Corn, sweet..... | 7,563 | 7,478 | 15,253 | 10,800 | 4,975 | 7,497 | 5,431 |
| Cucumbers..... | 13,446 | 10,874 | 14,225 | 10,585 | 9,405 | 9,356 | 12,054 |
| Eggplant..... | 1,803 | 982 | 937 | 931 | 714 | 777 | 887 |
| Lettuce..... | 17,561 | 19,405 | 23,708 | 28,233 | 22,118 | 31,064 | 37,034 |
| Onions..... | 23,342 | 16,472 | 21,488 | 16,272 | 18,775 | 24,099 | 19,039 |
| Peas, green..... | 13,061 | 18,220 | 16,089 | 18,609 | 18,808 | 19,879 | 21,338 |
| Peppers..... | 4,880 | 4,141 | 4,440 | 4,540 | 3,559 | 4,201 | 4,566 |
| Pimientos..... | | | | 518 | 636 | 627 | 742 |
| Potatoes, early..... | 41,690 | 40,165 | 42,895 | 56,022 | 61,358 | 31,076 | 46,662 |
| Spinach..... | 5,305 | 7,770 | 8,066 | 7,624 | 7,927 | 8,052 | 8,712 |
| Strawberries..... | 38,258 | 44,381 | 40,623 | 48,231 | 48,268 | 45,711 | 44,872 |
| Tomatoes..... | 56,228 | 57,700 | 63,405 | 42,820 | 43,629 | 41,261 | 50,777 |
| Watermelons..... | 10,645 | 9,147 | 13,360 | 10,150 | 10,741 | 11,025 | 11,820 |
| Total..... | 323,295 | 318,218 | 348,183 | 341,157 | 343,129 | 331,964 | 369,736 |

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 286.—*Fruits and vegetables: Unloads of 13 commodities at 11 markets in car lots, 1927-1928*

| Commodity and year | New York | Chi-cago | Phila-delphia | Pitts-burgh | St. Louis | Cin-cin-nati | Min-neap-olis | Kan-sas City | Wash-ing-ton | Cleve-land | De-troit | Total |
|-----------------------------|-------------|-------------|---------------|-------------|-------------|--------------|---------------|--------------|--------------|-------------|-------------|-------------|
| Apples: | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| 1927 | 12,827 | 6,868 | 1,586 | 2,127 | 1,248 | 1,301 | 712 | 1,050 | 316 | 1,106 | 1,824 | 30,965 |
| 1928 | 12,923 | 7,428 | 2,211 | 1,932 | 1,325 | 1,153 | 748 | 1,104 | 483 | 1,640 | 2,415 | 33,362 |
| Cabbage: | | | | | | | | | | | | |
| 1927 | 4,240 | 1,878 | 2,039 | 1,228 | 1,237 | 675 | 147 | 448 | 431 | 728 | 670 | 13,721 |
| 1928 | 4,853 | 2,228 | 2,199 | 1,158 | 1,194 | 725 | 137 | 407 | 578 | 572 | 717 | 14,768 |
| Cantaloupes: | | | | | | | | | | | | |
| 1927 | 7,401 | 3,211 | 1,932 | 1,302 | 697 | 667 | 243 | 426 | 359 | 1,039 | 1,000 | 18,277 |
| 1928 | 8,930 | 3,263 | 1,937 | 1,403 | 710 | 650 | 225 | 430 | 429 | 991 | 988 | 19,956 |
| Celery: | | | | | | | | | | | | |
| 1927 | 4,463 | 2,378 | 1,512 | 817 | 566 | 412 | 321 | 368 | 346 | 423 | 712 | 12,318 |
| 1928 | 4,926 | 2,302 | 1,698 | 791 | 617 | 374 | 340 | 405 | 353 | 411 | 708 | 12,925 |
| Grapes: | | | | | | | | | | | | |
| 1927 | 18,587 | 7,029 | 4,369 | 2,498 | 921 | 595 | 370 | 385 | 291 | 1,743 | 1,746 | 38,534 |
| 1928 | 14,455 | 5,751 | 4,061 | 3,016 | 931 | 637 | 405 | 492 | 295 | 1,468 | 2,036 | 33,547 |
| Lettuce: | | | | | | | | | | | | |
| 1927 | 9,054 | 4,548 | 2,911 | 1,087 | 1,271 | 561 | 463 | 636 | 530 | 1,017 | 1,388 | 23,466 |
| 1928 | 9,098 | 4,491 | 2,762 | 1,198 | 1,238 | 548 | 532 | 698 | 559 | 916 | 1,406 | 23,440 |
| Onions: | | | | | | | | | | | | |
| 1927 | 9,421 | 2,327 | 2,018 | 858 | 964 | 423 | 156 | 455 | 276 | 748 | 1,130 | 18,776 |
| 1928 | 11,863 | 2,347 | 1,962 | 851 | 796 | 465 | 197 | 432 | 318 | 785 | 1,079 | 21,095 |
| Peaches: | | | | | | | | | | | | |
| 1927 | 4,773 | 2,158 | 959 | 769 | 608 | 641 | 266 | 305 | 293 | 863 | 1,243 | 12,978 |
| 1928 | 5,859 | 2,374 | 1,467 | 1,037 | 816 | 909 | 321 | 558 | 329 | 933 | 1,452 | 16,055 |
| Potatoes: | | | | | | | | | | | | |
| 1927 | 22,308 | 15,685 | 7,818 | 3,775 | 4,410 | 3,001 | 798 | 2,907 | 1,691 | 3,703 | 5,500 | 71,596 |
| 1928 | 22,029 | 16,311 | 6,653 | 3,565 | 3,047 | 2,970 | 524 | 2,603 | 1,753 | 3,699 | 5,508 | 69,262 |
| Strawberries: | | | | | | | | | | | | |
| 1927 | 2,181 | 1,701 | 447 | 484 | 296 | 364 | 235 | 225 | 85 | 426 | 718 | 7,162 |
| 1928 | 2,097 | 1,590 | 378 | 520 | 330 | 559 | 249 | 267 | 53 | 428 | 877 | 7,348 |
| Sweet potatoes: | | | | | | | | | | | | |
| 1927 | 2,707 | 1,859 | 422 | 1,014 | 318 | 603 | 184 | 180 | 251 | 655 | 781 | 8,974 |
| 1928 | 2,235 | 1,711 | 281 | 973 | 215 | 496 | 185 | 101 | 272 | 564 | 631 | 7,064 |
| Tomatoes: | | | | | | | | | | | | |
| 1927 | 7,158 | 3,314 | 1,726 | 1,488 | 655 | 505 | 256 | 314 | 387 | 377 | 1,186 | 17,366 |
| 1928 | 7,456 | 3,132 | 1,355 | 1,347 | 527 | 478 | 227 | 282 | 341 | 340 | 1,129 | 16,614 |
| Watermelons: | | | | | | | | | | | | |
| 1927 | 3,328 | 2,397 | 1,340 | 795 | 930 | 794 | 298 | 513 | 494 | 811 | 1,167 | 12,867 |
| 1928 | 3,663 | 2,371 | 1,351 | 895 | 1,001 | 942 | 268 | 558 | 502 | 956 | 1,418 | 13,925 |
| Total:^{1 2} | | | | | | | | | | | | |
| 1920 | 48,295 | 27,225 | 17,521 | 14,421 | 7,359 | 6,225 | 1,828 | 5,032 | 2,847 | 7,585 | 6,272 | 144,610 |
| 1921 | 59,107 | 32,467 | 19,430 | 15,130 | 9,083 | 8,217 | 2,122 | 5,650 | 3,131 | 7,818 | 6,193 | 168,348 |
| 1922 | 67,448 | 35,405 | 20,126 | 15,869 | 10,436 | 8,874 | 2,819 | 5,989 | 4,079 | 9,666 | 8,633 | 189,344 |
| 1923 | 89,906 | 45,025 | 25,734 | 18,827 | 11,057 | 9,604 | 3,049 | 7,173 | 4,607 | 11,110 | 10,744 | 236,836 |
| 1924 | 102,035 | 49,484 | 29,661 | 18,443 | 12,244 | 10,465 | 3,844 | 7,220 | 5,365 | 13,509 | 11,517 | 263,787 |
| 1925 | 105,285 | 51,015 | 30,437 | 18,480 | 13,300 | 10,197 | 4,402 | 8,587 | 5,909 | 13,248 | 15,539 | 276,399 |
| 1926 | 107,870 | 53,060 | 30,121 | 18,666 | 14,214 | 10,509 | 5,316 | 7,870 | 6,155 | 13,913 | 17,509 | 285,206 |
| 1927 | 110,906 | 55,353 | 29,079 | 18,242 | 14,121 | 10,542 | 4,449 | 8,212 | 5,750 | 13,639 | 19,065 | 289,438 |
| 1928 | 111,913 | 58,331 | 28,315 | 18,686 | 13,347 | 10,906 | 4,358 | 8,337 | 6,547 | 13,703 | 20,364 | 294,807 |

Bureau of Agricultural Economics. Compiled from daily reports made by common carriers to bureau representatives in the various markets. Unloads as shown in car lots include those by boat reduced to car-lot basis. See 1927 yearbook, p. 904, for data for earlier years.

¹ Total includes: 1920, 9 commodities; 1921 and 1922, 10 commodities; 1923, 12 commodities; beginning 1924, 13 commodities.

² The totals included, *c.* 1. unloads converted to car-lot equivalents as follows: New York, 6,766 cars in 1920; 5,498 in 1921; 6,493 in 1922; 5,856 in 1923; 5,805 in 1924; 4,765 in 1925; 3,414 in 1926; 2,463 in 1927; 1,526 in 1928; Chicago, 3,032 in 1928; Washington, 282 in 1928.

STATISTICS OF FRUITS AND VEGETABLES

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TABLE 287.—*Vegetables, canned: Production and value for census years, 1899–1927*

| Commodity | Standard cases ¹ | | | | | | | Actual cases | |
|--|---------------------------------|---------------------------------|-------------|-------------|-------------|------------------|-------------|--------------|-------------|
| | 1899 | 1904 | 1909 | 1914 | 1919 | 1921 | 1923 | 1925 | 1927 |
| | 1,000 cases (²) | 1,000 cases (²) | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases |
| Asparagus..... | | | 229 | 638 | 1,007 | 740 | 1,462 | 1,896 | 2,177 |
| Beans with pork, with sauce and baked ³ | | | 1,752 | 5,977 | 11,142 | (⁴) | 14,424 | 17,009 | 17,887 |
| Beans other than baked..... | 1,494 | 2,588 | 1,641 | 3,017 | 3,682 | 11,316 | 6,044 | 7,671 | 7,473 |
| Beets..... | | | 126 | 252 | 584 | 391 | 545 | 1,557 | 815 |
| Corn..... | 6,337 | 11,210 | 7,451 | 9,920 | 14,403 | 9,011 | 14,704 | 22,597 | 10,255 |
| Hominy..... | | | | 686 | 587 | | | 1,133 | 1,695 |
| Kraut..... | | | | 1,181 | 1,042 | (⁵) | 2,072 | 2,395 | 3,101 |
| Peas..... | 2,544 | 4,694 | 5,902 | 8,826 | 9,323 | 8,222 | 14,434 | 16,544 | 13,085 |
| Pimientos..... | | | | | | | | 253 | 487 |
| Pumpkin..... | 138 | 247 | 440 | 789 | 383 | | | 1,183 | 1,094 |
| Squash..... | | | 114 | 166 | 55 | | | | |
| Spaghetti..... | | | | | | | | 1,841 | 2,751 |
| Spinach..... | | | 149 | 392 | 676 | 581 | 1,875 | 2,045 | 2,462 |
| Sweet potatoes..... | 84 | 193 | 347 | 454 | 716 | 623 | | | |
| Tomatoes..... | 8,701 | 9,411 | 12,910 | 16,200 | 11,835 | 4,134 | 11,781 | 21,807 | 18,229 |
| Tomato paste..... | | | | | 113 | (⁶) | 219 | 623 | 438 |
| Tomato pulp..... | | | | 752 | 1,518 | (⁶) | 2,005 | 3,630 | 2,159 |
| Tomato sauce..... | | | | | | | | 580 | 410 |
| Other vegetables..... | 27 | 1,237 | 1,691 | 1,005 | 1,009 | 3,169 | 3,186 | 191,335 | 12,539 |
| Canned soups..... | | | 854 | 4,886 | 5,845 | 6,862 | 14,186 | | |

| Commodity | VALUE | | | | | | | | | |
|--|----------------------------|----------------------------|--------|--------|---------|------------------|---------|---------|---------|--------|
| | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| | dolls. (²) | dolls. (²) | dolls. | dolls. | dolls. | dolls. | dolls. | dolls. | dolls. | dolls. |
| Asparagus..... | | | 1,976 | 2,791 | 6,572 | 5,137 | 10,953 | 10,487 | 12,202 | |
| Beans with pork, with sauce and baked..... | | | 3,418 | 11,535 | 28,551 | (⁴) | 25,265 | 35,511 | 34,959 | |
| Beans other than baked..... | 2,025 | 4,134 | 2,596 | 5,030 | 10,857 | 30,712 | 14,373 | 19,653 | 18,110 | |
| Beets..... | | | 261 | 512 | 1,951 | 1,203 | 1,763 | 3,810 | 2,050 | |
| Corn..... | 8,191 | 15,952 | 10,332 | 13,923 | 35,532 | 19,550 | 30,833 | 51,346 | 22,855 | |
| Hominy..... | | | | 713 | 1,346 | | | 1,517 | 2,180 | |
| Kraut..... | | | | 1,568 | 2,845 | (⁵) | 5,146 | 4,574 | 5,160 | |
| Peas..... | 4,466 | 7,929 | 10,247 | 15,089 | 25,073 | 22,953 | 39,768 | 42,887 | 34,031 | |
| Pimientos..... | | | | | | | | 1,463 | 2,069 | |
| Pumpkin..... | 202 | 346 | 576 | 1,023 | 861 | | | 2,593 | 1,984 | |
| Squash..... | | | 195 | 294 | 165 | | | | | |
| Spaghetti..... | | | | | | | | 5,551 | 6,061 | |
| Spinach..... | | | 204 | 737 | 2,338 | 2,087 | 4,978 | 5,456 | 6,225 | |
| Sweet potatoes..... | 124 | 284 | 532 | 737 | 2,478 | 1,808 | | 2,122 | | |
| Tomatoes..... | 13,607 | 14,021 | 18,748 | 25,532 | 38,068 | 12,509 | 39,677 | 42,680 | 33,814 | |
| Tomato paste..... | | | | | 1,301 | (⁶) | 1,988 | 2,409 | 2,298 | |
| Tomato pulp..... | | | | 1,454 | 3,819 | (⁶) | 3,870 | 6,639 | 3,861 | |
| Tomato sauce..... | | | | | | | | 1,947 | 1,084 | |
| Other vegetables..... | 60 | 2,945 | 2,304 | 3,476 | 2,817 | 8,645 | 8,964 | 41,842 | 45,017 | |
| Canned soups..... | | | 2,589 | 7,877 | 11,858 | 13,584 | 27,135 | | | |
| Total vegetables and soups..... | 28,735 | 45,611 | 54,158 | 92,291 | 176,432 | 118,198 | 214,715 | 282,891 | 234,266 | |

Bureau of Agricultural Economics. Data for 1899, 1904, and 1909, Thirteenth Census of United States, 1910, Vol. X, Manufactures, pp. 391–396. Data for 1914, Census of Manufactures, 1914, Vol. II, pp. 382–383. Data for 1919, 1921, 1923, 1925, 1927, Census of Manufactures bulletins on canning and preserving.

¹ Standard cases expressed as follows: Asparagus, 1909, 24 No. 3 cans, 1914, 24 No. 2 cans, 1919, 1921, 1923, No. 2½ cans; beans, 24 No. 2 cans; beets, 24 No. 3 cans; corn, 24 No. 2 cans; hominy, 24 No. 3 cans; kraut, 24 No. 3 cans; peas, 24 No. 2 cans; pumpkin, 24 No. 3 cans; squash, 24 No. 3 cans; spinach, 24 No. 3 cans; sweet potatoes, 24 No. 3 cans; tomatoes, 24 No. 3 cans; tomato paste, 100 six-ounce cans; tomato pulp, 1914, standard cases of 12 No. 10 cans, 1919 and 1923, 6 No. 10 cans; other vegetables, 21 No. 3 cans except succotash in 1909, 1914, and 1919, which are No. 2 cans; canned soup, 48 No. 1 cans.

² Not reported separately.

³ 1909–1923 reported as baked beans.

⁴ Included in beans other than baked.

⁵ Reported as other canned vegetables and canned soups.

TABLE 288.—*Vegetables, canned: Quantity, by States and total value, 1927*¹

| State | Asparagus | Beans with pork, with sauce and baked | Beans other than baked | Beets | Corn | Kraut | Peas | Pumpkin and squash | Spinach | Tomatoes | Tomato paste, pulp and sauce | Other canned vegetables and soups | Total |
|--------------------------------------|----------------|---|---------------------------|----------------|----------------|----------------|----------------|-----------------------|----------------|----------------|---------------------------------|--|----------------|
| | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases |
| Maine..... | | | 91 | | 741 | | 86 | | | | | 49 | 967 |
| Vermont..... | | | | | 112 | | | | | | | | 112 |
| New York..... | 4 | 1,323 | 1,114 | 231 | 640 | 1,333 | 1,610 | 25 | 88 | 423 | | 148 | 6,939 |
| New Jersey..... | | 14,253 | 105 | 04 | | | | 53 | | 311 | 207 | (²) | 14,093 |
| Pennsylvania..... | | | 243 | 3 | 194 | | | 178 | | 274 | | 390 | 1,282 |
| Ohio..... | | 139 | 126 | 7 | 902 | | | 54 | 5 | 216 | 54 | 25 | 1,730 |
| Indiana..... | | | 540 | | 733 | 294 | 109 | 362 | | 1,280 | 1,212 | 1,778 | 6,308 |
| Illinois..... | | 860 | 612 | | 1,064 | 29 | 591 | 76 | | 218 | 28 | 217 | 4,595 |
| Michigan..... | 4 | 610 | 510 | 56 | 80 | 57 | 404 | 56 | | 103 | | 33 | 1,913 |
| Wisconsin..... | | | 582 | 232 | 309 | 770 | 6,608 | | | | | | 8,501 |
| Minnesota..... | | | | | 964 | | 520 | | | | | | 1,487 |
| Iowa..... | | | | | 1,429 | | | 90 | | | | | 1,655 |
| Missouri..... | | | 65 | | | | | | | 136 | | | 762 |
| Nebraska..... | | | | | 228 | | | | | 697 | | | 228 |
| Delaware..... | | | 416 | | 201 | | 220 | | | 1,201 | 96 | | 2,134 |
| Maryland..... | | 525 | 1,275 | 39 | 1,523 | 5 | 1,101 | | 305 | 6,005 | 208 | 277 | 11,263 |
| Virginia..... | | | | | | | | | | 1,196 | | 29 | 1,225 |
| Georgia..... | | | | | | | | | | | | 229 | 229 |
| Kentucky..... | | | 14 | | | | | | | 373 | | | 387 |
| Tennessee..... | | | 130 | | | 104 | | | | 592 | 6 | | 832 |
| Mississippi..... | | | 78 | | | | | | | | | 130 | 208 |
| Arkansas..... | | | 41 | | | | | | | 1,169 | | 11 | 1,221 |
| Louisiana..... | | | 26 | | | | | | | | | | 26 |
| Oklahoma..... | | | | | | | | | | 57 | | | 57 |
| Texas..... | | | 18 | | | | | | | 22 | | | 40 |
| Montana..... | | | | | | | 261 | | | | | | 261 |
| Colorado..... | | | 299 | | | | | | | 178 | 37 | | 514 |
| Utah..... | | | 145 | 9 | | | 758 | 9 | | 978 | 168 | 24 | 2,091 |
| Washington..... | | 13 | 41 | | | 3 | 126 | 18 | | | | 45 | 246 |
| Oregon..... | | | 48 | | | | | 133 | | 15 | | 150 | 346 |
| California..... | 2,151 | | 98 | | | | | | 1,089 | 2,588 | 955 | 458 | 8,239 |
| Other States..... | 18 | 164 | 856 | 174 | 235 | 506 | 311 | 215 | 75 | 197 | 336 | 10,728 | 13,815 |
| Total..... | 2,177 | 17,887 | 7,473 | 815 | 10,255 | 3,101 | 13,085 | 1,094 | 2,462 | 18,229 | 3,307 | 17,472 | 97,357 |
| Total value, (1,000 dollars)..... | 12,202 | 34,959 | 18,110 | 2,050 | 22,855 | 5,460 | 34,031 | 1,984 | 6,225 | 33,814 | 7,243 | 55,327 | 234,260 |

Bureau of Agricultural Economics. Compiled from Census of Manufactures, 1927.

¹ Quantity stated in actual cases.² Includes Massachusetts and Maine.³ Includes Indiana and Pennsylvania.⁴ Figures can not be given without disclosing the production of individual establishments.⁵ Includes Iowa.⁶ Includes Nebraska and Utah.⁷ Includes 2,751,000 cases of spaghetti not reported by States.⁸ Includes 1,695,000 cases of hominy of which 1,172,000 cases were for Indiana; and 2,751,000 cases of spaghetti not reported by States.

TABLE 289.—*Vegetables: Imports into the United States, exclusive of imports from Canada, 1925-1929*

| Commodity and country from which imported | Year ended June 30 | | | | | Commodity and country from which imported | Year ended June 30 | | | | |
|---|--------------------|-------------------|-------------------|-------------------|-------------------|---|--------------------|-------------------|-------------------|-------------------|-------------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 | | 1925 | 1926 | 1927 | 1928 | 1929 |
| Beans, Lima: | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | Eggplant: | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> |
| Total..... | 1,332 | 1,232 | 1,044 | 2,778 | 3,357 | Total..... | 2,925 | 5,178 | 6,587 | 7,061 | 6,562 |
| Cuba..... | 1,329 | 1,229 | 1,033 | 2,729 | 3,273 | Cuba..... | 2,767 | 4,708 | 6,085 | 6,216 | 6,265 |
| Mexico..... | | | | 49 | 84 | Mexico..... | 149 | 469 | 495 | 796 | 292 |
| Other countries..... | 3 | | | | | Other countries..... | 9 | 1 | 7 | 49 | 5 |
| Beans, string: | | | | | | Endive: | | | | | |
| Total..... | 64 | 503 | 469 | 914 | 2,584 | Total..... | 1,075 | 1,552 | 1,680 | 2,391 | 2,588 |
| Mexico..... | 62 | 413 | 428 | 888 | 2,549 | Belgium..... | 1,063 | 1,536 | 1,651 | 2,391 | 2,588 |
| Cuba..... | 2 | 90 | 41 | 26 | 35 | France..... | 12 | 6 | | | |
| Beets: | | | | | | England..... | | 10 | 28 | | |
| Total..... | 828 | 997 | 644 | 864 | 403 | Netherlands..... | | | 1 | | |
| Bermuda..... | 674 | 739 | 414 | 552 | 16 | Horse-radish: | | | | | |
| Mexico..... | 154 | 258 | 220 | 312 | 354 | Total..... | 2,252 | 2,057 | 767 | 690 | 1,389 |
| Other countries..... | | | 10 | | 33 | Germany..... | 2,252 | 2,029 | 767 | 690 | 1,387 |
| Cabbage: | | | | | | Other countries..... | | 28 | | | 2 |
| Total..... | 842 | 14,698 | 3,050 | 95 | 6,241 | Kale: Bermuda..... | 643 | 678 | 908 | 676 | 1,150 |
| Netherlands..... | 794 | 11,506 | 3,009 | 40 | 5,822 | Okra: | | | | | |
| Denmark..... | | 2,573 | | | 384 | Total..... | 293 | 920 | 640 | 1,349 | 1,557 |
| Cuba..... | | 524 | | 20 | 1 | Cuba..... | 293 | 893 | 640 | 1,345 | 1,557 |
| Mexico..... | 28 | 34 | 41 | 34 | 34 | Mexico..... | | 36 | | 4 | |
| Other countries..... | 20 | 1 | | 1 | | Parsley: | | | | | |
| Carrots: | | | | | | Total..... | 1,110 | 1,515 | 1,045 | 1,621 | 660 |
| Total..... | 2,462 | 2,668 | 2,408 | 2,026 | 5,577 | Bermuda..... | 1,095 | 1,493 | 1,020 | 1,593 | 635 |
| Mexico..... | 271 | 383 | 471 | 652 | 569 | Mexico..... | 15 | 22 | 25 | 28 | 25 |
| Bermuda..... | 2,191 | 2,285 | 1,887 | 1,374 | 255 | Peas: | | | | | |
| Netherlands..... | | | 50 | | 4,686 | Total..... | 3,331 | 9,095 | 14,278 | 14,443 | 20,551 |
| Other countries..... | | | | | 67 | Mexico..... | 3,328 | 9,090 | 14,277 | 14,441 | 20,551 |
| Celery: | | | | | | Other countries..... | 3 | 5 | 1 | 2 | |
| Total..... | 1,313 | 2,271 | 3,706 | 2,667 | 3,522 | Peppers: | | | | | |
| Bermuda..... | 1,312 | 2,270 | 3,705 | 2,665 | 3,519 | Total..... | 10,441 | 17,391 | 17,608 | 16,631 | 12,222 |
| Other countries..... | 1 | 1 | 1 | 2 | 3 | Cuba..... | 6,338 | 12,032 | 8,620 | 6,008 | 4,479 |
| Cucumbers: | | | | | | Mexico..... | 4,102 | 5,350 | 8,968 | 10,602 | 7,738 |
| Total..... | 331 | 670 | 1,325 | 1,247 | 966 | Virgin Islands..... | | 1 | 15 | 15 | 1 |
| Cuba..... | 170 | 460 | 1,015 | 1,030 | 952 | Other countries..... | 1 | 8 | 5 | 6 | 4 |
| Mexico..... | 161 | 200 | 310 | 216 | 13 | | | | | | |
| Other countries..... | | 10 | | 1 | 1 | | | | | | |

Bureau of Agricultural Economics. Compiled from the annual reports of the Federal Horticultural Board, 1925-1929, as provided by quarantine 56, which became effective Nov. 1, 1923.

MISCELLANEOUS CROPS

TABLE 290.—*Beans, dry edible:*¹ *Acreage, production, value, exports, etc., United States, 1899, 1909, 1914-1929*

| Year | Acreage | Average yield per acre | Production | Price per bushel received by producers Dec. 1 ² | Farm value | Whole-sale price at Chicago ³ | Imports year beginning July 1 ⁴ | Domestic exports, year beginning July 1 ⁴ |
|------|-------------|------------------------|---------------|--|---------------|--|--|--|
| | 1,000 acres | Bushels | 1,000 bushels | Dollars | 1,000 dollars | Dollars | 1,000 bushels | 1,000 bushels |
| 1899 | 454 | 11.3 | 5,064 | | | 1.23 | | |
| 1909 | 808 | 14.0 | 11,351 | | | 2.27 | 1,015 | |
| 1914 | 875 | 13.2 | 11,585 | 2.26 | 26,213 | 1.33 | 906 | |
| 1915 | 928 | 11.1 | 10,321 | 2.59 | 26,771 | 1.91 | 663 | |
| 1916 | 1,107 | 9.7 | 10,715 | 5.10 | 54,686 | 2.54 | 3,748 | |
| 1917 | 1,821 | 8.8 | 16,045 | 6.50 | 104,350 | 5.45 | 4,146 | 1,517 |
| 1918 | 1,744 | 10.0 | 17,397 | 5.28 | 91,863 | 6.89 | 4,016 | 4,489 |
| 1919 | 1,163 | 12.1 | 14,079 | | | | | |
| 1920 | 1,065 | 12.6 | 13,399 | 4.28 | 57,046 | 4.75 | 3,806 | 1,993 |
| 1921 | 852 | 10.8 | 9,225 | 2.96 | 27,282 | 4.06 | 824 | 1,216 |
| 1922 | 782 | 11.7 | 9,185 | 2.67 | 24,515 | 2.77 | 520 | 1,100 |
| 1923 | 1,086 | 11.9 | 12,877 | 3.74 | 48,133 | 4.48 | 2,623 | 672 |
| 1924 | 1,344 | 12.1 | 16,308 | 3.67 | 59,782 | 4.22 | 886 | 695 |
| 1925 | 1,637 | | | | | | | |
| 1926 | 1,576 | 9.6 | 15,164 | 3.74 | 56,744 | 3.28 | 1,421 | 549 |
| 1927 | 1,606 | 12.4 | 19,928 | 3.28 | 65,376 | 3.70 | 1,271 | 576 |
| 1928 | 1,677 | 10.6 | 17,707 | 2.93 | 51,876 | 2.97 | 1,051 | 529 |
| 1929 | 1,571 | 10.3 | 16,181 | 2.88 | 46,612 | 3.31 | 2,465 | 427 |
| 1928 | 1,643 | 10.7 | 17,656 | 4.18 | 73,815 | 5.40 | 1,595 | 316 |
| 1929 | 1,879 | 10.3 | 19,337 | 3.77 | 72,905 | 5.86 | | |

Bureau of Agricultural Economics. Italic figures are census returns; census figures include all States; other figures, estimates of crop-reporting board, principal producing States only.

¹ Table includes, besides the ordinary edible beans and Limas, the blackeye of California which is identical with the blackeyed pea of the South. Soybeans not included.

² Farm prices are as of Nov. 15, 1914-1924.

³ Prices 1899 and 1909 from Chicago Board of Trade annual reports, quotations for navy, good to choice; 1914-1928 from Daily Trade Bulletin, pea beans (quoted per 100 pounds; converted to bushels of 60 pounds.)

⁴ Imports and exports compiled from Commerce and Navigation of the United States, 1910-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1926; January and June issues, 1927-1929; and official records of the Bureau of Foreign and Domestic Commerce.

⁵ Not separately reported prior to 1918.

⁶ 11 months.

⁷ Not separately reported.

⁸ Preliminary.

TABLE 291.—*Beans, dry edible:*¹ *Acreage, production, and December 1 price, by States, 1926-1929*

| State | Acreage | | | | Average yield per acre | | | | Production | | | | Price per bushel received by producers Dec. 1-- | | | |
|---------|-------------|-------------|-------------|-------------------|------------------------|-------|-------|-------|------------|------------|------------|-------------------|---|--------|--------|--------|
| | 1926 | 1927 | 1928 | 1929 ² | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 ² | 1926 | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | Bush. | Bush. | Bush. | Bush. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | Dolls. | Dolls. | Dolls. | Dolls. |
| Mo. | 5 | 6 | 6 | 6 | 17.0 | 16.0 | 15.0 | 16.5 | 85 | 96 | 90 | 99 | 5.50 | 4.00 | 5.10 | 5.10 |
| Vt. | 5 | 5 | 5 | 6 | 10.0 | 14.0 | 14.0 | 15.0 | 50 | 70 | 70 | 90 | 5.00 | 4.10 | 5.15 | 4.20 |
| N. Y. | 97 | 75 | 80 | 100 | 11.8 | 13.0 | 14.5 | 12.5 | 1,145 | 975 | 1,160 | 1,250 | 3.70 | 3.70 | 4.70 | 4.45 |
| Mich. | 552 | 568 | 538 | 694 | 12.0 | 8.5 | 11.0 | 8.2 | 6,624 | 4,811 | 5,918 | 5,691 | 2.80 | 3.00 | 4.45 | 3.70 |
| Wis. | 9 | 6 | 9 | 9 | 7.5 | 6.7 | 9.0 | 8.5 | 68 | 40 | 54 | 79 | 3.00 | 3.30 | 3.90 | 3.60 |
| Minn. | 7 | 5 | 5 | 6 | 12.0 | 11.0 | 9.0 | 9.0 | 84 | 55 | 45 | 54 | 3.10 | 3.30 | 4.00 | 4.35 |
| Nebr. | 4 | 5 | 9 | 9 | 8.3 | 12.3 | 9.7 | 9.4 | 33 | 62 | 87 | 85 | 3.70 | 3.50 | 3.50 | 3.75 |
| Kans. | | | 6 | 20 | | | 6.0 | 7.0 | | | 36 | 140 | | | 3.75 | 3.70 |
| N. C. | | 2 | 2 | 2 | | 5.0 | 4.5 | 4.0 | | 10 | 9 | 8 | | 3.70 | 3.70 | 4.50 |
| Mont. | 43 | 32 | 40 | 50 | 10.0 | 20.0 | 14.5 | 10.5 | 430 | 640 | 580 | 525 | 2.80 | 3.00 | 3.85 | 3.60 |
| Idaho | 54 | 72 | 86 | 92 | 18.5 | 23.7 | 19.0 | 23.0 | 999 | 1,634 | 2,116 | 2,116 | 2.60 | 2.50 | 3.60 | 2.75 |
| Wyo. | 16 | 17 | 24 | 26 | 12.5 | 18.0 | 15.0 | 18.5 | 200 | 306 | 360 | 481 | 3.00 | 2.90 | 3.40 | 3.10 |
| Colo. | 378 | 281 | 309 | 294 | 3.6 | 5.5 | 4.5 | 6.5 | 1,361 | 1,546 | 1,390 | 1,911 | 2.80 | 2.70 | 3.40 | 2.70 |
| N. Mex. | 195 | 195 | 214 | 225 | 4.3 | 5.0 | 4.0 | 7.5 | 838 | 975 | 856 | 1,088 | 2.60 | 2.90 | 3.15 | 2.60 |
| Ariz. | 7 | 8 | 6 | 6 | 8.0 | 8.0 | 7.0 | 8.0 | 56 | 64 | 42 | 48 | 3.50 | 3.60 | 3.70 | 3.15 |
| Calif. | 305 | 296 | 307 | 334 | 18.8 | 16.3 | 17.3 | 15.2 | 5,734 | 4,825 | 5,325 | 5,075 | 3.00 | 2.70 | 4.40 | 4.95 |
| U. S. | 1,677 | 1,571 | 1,643 | 1,879 | 10.6 | 10.3 | 10.7 | 10.3 | 17,707 | 16,181 | 17,656 | 19,337 | 2.93 | 2.88 | 4.18 | 3.77 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Table includes, besides the ordinary edible beans and Limas, the blackeye of California which is identical with the blackeyed pea of the South. Soybeans not included.

² Preliminary.

TABLE 292.—Beans, dry edible: ¹ Production by varieties, leading States, 1928 and 1929

| State and year | White pea beans | Small white | Large white | Great Northern | Yellow eye | White kidney | Red kidney | Cranberry | Red Mexican | Pinto | Pinks | Limas ² | Black eye | Other varieties ³ | Total |
|------------------------|-----------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------------|---------------|------------------------------|-----------------|
| | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. | 1,000 bus. |
| Maine: | | | | | | | | | | | | | | | |
| 1928 | 18 | | 5 | | 38 | 6 | 16 | | | | | | | 7 | 10 |
| 1929 | 7 | | 5 | | 54 | 7 | 11 | | | | | | | 12 | 99 |
| Vermont: | | | | | | | | | | | | | | | |
| 1928 | 10 | | 7 | | 31 | 4 | 3 | | | | | | | 15 | 70 |
| 1929 | 14 | | 5 | | 45 | 5 | 4 | | | | | | | 17 | 60 |
| New York: ⁴ | | | | | | | | | | | | | | | |
| 1928 | 438 | | 184 | | 121 | 45 | 340 | | | | | | | 32 | 1,160 |
| 1929 | 516 | | 220 | | 105 | 62 | 335 | | | | | | | 12 | 1,250 |
| Michigan: | | | | | | | | | | | | | | | |
| 1928 | 4,900 | | 150 | | | | 460 | | | | | | | 204 | 5,918 |
| 1929 | 4,860 | | 180 | | | | 445 | | | | | | | 206 | 5,091 |
| Wisconsin: | | | | | | | | | | | | | | | |
| 1928 | 36 | | 10 | | | | | | | | | | | 8 | 54 |
| 1929 | 62 | | 8 | | | | | | | | | | | 6 | 76 |
| Minnesota: | | | | | | | | | | | | | | | |
| 1928 | 45 | | | | | | | | | | | | | | 45 |
| 1929 | 54 | | | | | | | | | | | | | | 54 |
| Nebraska: | | | | | | | | | | | | | | | |
| 1928 | | 14 | | 27 | | | | | | 42 | | | | | 87 |
| 1929 | | 42 | | 12 | | | | | | 31 | | | | | 85 |
| Montana: | | | | | | | | | | | | | | | |
| 1928 | | 19 | | 524 | | | | | 25 | | | | | 12 | 580 |
| 1929 | | 16 | | 475 | | | | | 25 | | | | | 9 | 525 |
| Idaho: | | | | | | | | | | | | | | | |
| 1928 | | 25 | | 1,134 | | | | | 245 | 10 | | | | ⁵ 220 | 1,634 |
| 1929 | | 35 | | 1,475 | | | | | 280 | 10 | | | | ⁵ 316 | 2,116 |
| Wyoming: | | | | | | | | | | | | | | | |
| 1928 | | | | 308 | | | | | | 11 | | | | | 41 |
| 1929 | | | | 395 | | | | | | 12 | | | | | ⁶ 74 |
| Colorado: | | | | | | | | | | | | | | | |
| 1928 | | | | 56 | | | | | | 1,302 | | | | 32 | 1,300 |
| 1929 | | | | 19 | | | | | | 1,816 | | | | 57 | 1,911 |
| New Mexico: | | | | | | | | | | | | | | | |
| 1928 | | | | | | | | | | 800 | 34 | | | 22 | 856 |
| 1929 | | | | | | | | | | 1,600 | 44 | | | 44 | 1,688 |
| Arizona: | | | | | | | | | | | | | | | |
| 1928 | | | | | | | | | | | 35 | | | 7 | 42 |
| 1929 | | | | | | | | | | | 40 | | | 8 | 48 |
| California: | | | | | | | | | | | | | | | |
| 1928 | | 707 | 38 | | | | 115 | 177 | 225 | 85 | 912 | 2,258 | 713 | ³ 95 | 5,325 |
| 1929 | | 650 | 30 | | | | 50 | 183 | 100 | 58 | 800 | 2,300 | 817 | ³ 87 | 5,075 |
| Total 14 States: | | | | | | | | | | | | | | | |
| 1928 | 5,447 | 769 | 394 | 2,049 | 190 | 55 | 1,134 | 177 | 495 | 2,250 | 981 | 2,258 | 713 | 609 ⁶ | 17,656 |
| 1929 | 5,513 | 762 | 448 | 2,376 | 204 | 74 | 848 | 183 | 405 | 3,527 | 884 | 2,300 | 817 | 848 ⁶ | 19,337 |

Bureau of Agricultural Economics. Based upon reports by growers on proportion of total production made up of each variety, supplemented by investigations of field statisticians.

¹ Table includes, besides the ordinary edible beans and Limas, the blackeye of California, which is identical with the blackeyed pea of the South. Soybeans not included.

² Limas include Baby Limas, 1928, 668; 1929, 700.

³ "Other" include Bayo; 1928, 20; 1929, 20.

⁴ Large white in New York is the marrow.

⁵ Including garden or seed beans: Idaho, 1928, 195; 1929, 291; and Wyoming, 1929, 72.

⁶ Including the production in North Carolina of "Other varieties": 1928, 9; 1929, 3; and in Kansas, 1928, 36; 1929, 140.

TABLE 293.—*Beans, dry: Car-lot shipments, by State of origin, 1920-1928*

| State | Crop movement season ¹ | | | | | | | | |
|-------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 ² |
| | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> | <i>Cars</i> |
| New York..... | 935 | 1,555 | 1,650 | 1,969 | 1,900 | 1,158 | 916 | 614 | 820 |
| Michigan..... | 5,095 | 4,784 | 5,477 | 8,333 | 7,848 | 10,506 | 8,699 | 4,980 | 6,444 |
| Montana..... | 29 | 12 | 44 | 104 | 124 | 288 | 280 | 386 | 536 |
| Idaho..... | 139 | 141 | 351 | 749 | 1,336 | 1,898 | 1,437 | 2,074 | 1,983 |
| Wyoming..... | — | 1 | — | 9 | 31 | 82 | 130 | 252 | 347 |
| Colorado..... | 333 | 486 | 427 | 1,732 | 1,316 | 2,927 | 1,866 | 1,711 | 1,563 |
| New Mexico..... | 740 | 839 | 75 | 146 | 388 | 170 | 412 | 608 | 677 |
| California..... | 3,148 | 3,403 | 3,774 | 2,951 | 1,847 | 2,558 | 3,433 | 3,230 | 2,598 |
| Other States..... | 80 | 83 | 46 | 100 | 134 | 138 | 114 | 55 | 71 |
| Total..... | 10,409 | 11,304 | 11,844 | 16,093 | 14,924 | 19,725 | 17,287 | 13,919 | 15,039 |

Bureau of Agricultural Economics. Compiled from monthly reports received by the bureau from local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

¹ Crop movement season extends from September of year shown through August of the following year.

² Preliminary.

TABLE 294.—*Beans, dry: Wholesale price per 100 pounds, 1900-1929*PEA, BOSTON ¹

| Year beginning September | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Aver age |
|-----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1900..... | — | — | — | — | 3.77 | 3.70 | 3.55 | 3.48 | 3.38 | 3.45 | 3.63 | 4.43 | — |
| 1901..... | 4.10 | 3.57 | 3.38 | 3.37 | 3.23 | 3.02 | 2.87 | 2.85 | 3.03 | 2.87 | 3.40 | 3.37 | 3.26 |
| 1902..... | 3.25 | 4.13 | 4.02 | 3.93 | 4.02 | 3.93 | 3.80 | 3.75 | 3.82 | 3.90 | 3.85 | 3.77 | 3.85 |
| 1903..... | 3.93 | 3.82 | 3.63 | 3.52 | 3.42 | 3.50 | 3.40 | 3.27 | 3.28 | 3.10 | 3.02 | 3.07 | 3.41 |
| 1904..... | 2.98 | 3.13 | 3.00 | 2.90 | 2.92 | 3.22 | 3.12 | 2.97 | 3.00 | 3.03 | 3.13 | 2.98 | 3.03 |
| 1905..... | 2.92 | 2.92 | 2.98 | 2.98 | 2.93 | 2.75 | 2.65 | 2.73 | 2.73 | 2.73 | 2.75 | 2.60 | 2.81 |
| 1906..... | 2.57 | 2.70 | 2.68 | 2.53 | 2.50 | 2.52 | 2.50 | 2.42 | 2.85 | 3.08 | 2.87 | 2.98 | 2.68 |
| 1907..... | 3.53 | 4.05 | 4.08 | 3.90 | 3.85 | 3.98 | 3.93 | 4.00 | 4.47 | 4.50 | 4.43 | 4.40 | 4.09 |
| 1908..... | 4.00 | 3.93 | 4.00 | 3.93 | 4.03 | 4.17 | 4.25 | 4.23 | 4.50 | 4.58 | 4.53 | 4.33 | 4.21 |
| 1909..... | 4.05 | 3.92 | 3.87 | 3.77 | 3.87 | 3.93 | 3.88 | 3.77 | 3.92 | 4.05 | 4.08 | 4.17 | 3.94 |
| 1910..... | 4.47 | 4.20 | 3.98 | 3.87 | 3.85 | 3.72 | 3.62 | 3.55 | 3.63 | 3.70 | 3.95 | 4.15 | 3.88 |
| 1911..... | 4.07 | 4.30 | 4.37 | 4.28 | 4.47 | 4.47 | 4.40 | 4.48 | 4.97 | 5.02 | 5.00 | 5.05 | 4.57 |
| 1912..... | 5.17 | 5.17 | 4.82 | 4.40 | 4.25 | 4.17 | 4.03 | 3.98 | 4.13 | 4.07 | 3.97 | 3.70 | 4.32 |
| 1913..... | 3.90 | 3.92 | 3.73 | 3.65 | 3.63 | 3.58 | 3.57 | 3.73 | 3.85 | 3.68 | 3.68 | 4.87 | 3.82 |
| 1914..... | 4.75 | 4.18 | 4.53 | 4.65 | 5.30 | 5.70 | 5.40 | 5.30 | 5.40 | 5.40 | 5.13 | 5.12 | 5.07 |
| 1915..... | 5.43 | 6.13 | 6.60 | 6.65 | 6.78 | 6.63 | 6.52 | 6.70 | 7.05 | 8.05 | 10.23 | 9.37 | 7.18 |
| 1916..... | 9.22 | 9.87 | 11.67 | 11.23 | 11.43 | 12.08 | 13.03 | 14.70 | 16.40 | 15.47 | 14.68 | 13.75 | 11.79 |
| 1917..... | 13.80 | 15.15 | — | — | — | — | 14.19 | 13.56 | 12.88 | 12.35 | 12.00 | 11.75 | — |
| 1918..... | 11.05 | 10.75 | 10.75 | 10.05 | 9.47 | 8.00 | 7.40 | 7.84 | 7.97 | 7.80 | 7.72 | 8.68 | 8.96 |
| 1919..... | 8.28 | 7.81 | 7.58 | 7.75 | 7.51 | 7.62 | 7.46 | 7.29 | 7.62 | 7.62 | 7.59 | 6.99 | 7.59 |
| 1920..... | 6.88 | 6.36 | 5.67 | 5.14 | 4.98 | 4.68 | 4.64 | 4.52 | 4.44 | 4.64 | 4.58 | 4.90 | 5.12 |
| 1921..... | 5.41 | 5.24 | 5.34 | 5.08 | 5.14 | 5.76 | 6.88 | 7.34 | 8.14 | 9.69 | 9.75 | 9.03 | 6.90 |
| 1922..... | 7.06 | 6.97 | 7.68 | 7.81 | 7.62 | 7.71 | 7.66 | 7.60 | 7.27 | 7.35 | 7.18 | 6.89 | 7.40 |
| 1923..... | 7.40 | 7.75 | 7.79 | 7.12 | 7.06 | 7.40 | 7.30 | 7.28 | 7.12 | 7.12 | 7.16 | 7.68 | 7.35 |
| 1924..... | 8.04 | 8.18 | 8.10 | 8.00 | 6.94 | 7.20 | 6.91 | 6.60 | 6.31 | 6.34 | 6.17 | 5.89 | 7.06 |
| 1925..... | 5.50 | 5.49 | 5.86 | 5.90 | 5.67 | 5.49 | 5.32 | 5.06 | 5.01 | 5.48 | 5.65 | 5.45 | 5.49 |
| 1926..... | 5.28 | 5.98 | 6.32 | 6.11 | 5.80 | 5.66 | 5.38 | 5.28 | 5.46 | 6.29 | 6.48 | 6.62 | 5.89 |
| 1927..... | 6.34 | 6.18 | 6.12 | 6.16 | 6.69 | 7.88 | 8.71 | 9.81 | 10.08 | 10.18 | 10.30 | 10.22 | 8.22 |
| 1928..... | 9.94 | 9.75 | 9.55 | 9.50 | 9.95 | 10.97 | 11.13 | 10.41 | 10.45 | — | 10.38 | 9.97 | 10.19 |
| 1929..... | 10.56 | 10.12 | 8.66 | 8.09 | — | — | — | — | — | — | — | — | — |

¹ Quoted as New York and Michigan, hand picked.

STATISTICS OF MISCELLANEOUS CROPS

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TABLE 294.—*Beans, dry: Wholesale price per 100 pounds, 1900–1929—Contd.*

SMALL WHITE, SAN FRANCISCO

| Year beginning September | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Average |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1900 | 3.88 | 3.68 | 3.95 | 4.25 | 4.15 | 4.32 | 4.25 | 4.35 | 4.32 | 4.25 | 4.20 | 3.12 | 4.06 |
| 1901 | 3.15 | 3.50 | 3.00 | 3.02 | | | | | | | | | |
| 1902 | | | | | 3.15 | 3.12 | 3.15 | 3.15 | 3.08 | 3.12 | 3.12 | 3.10 | |
| 1903 | 3.05 | 3.12 | 2.95 | 2.70 | 2.88 | 2.90 | 2.98 | 3.02 | 3.02 | 2.98 | 2.88 | 2.88 | 2.95 |
| 1904 | 2.92 | 3.04 | 3.02 | 3.02 | 3.02 | 3.02 | 3.10 | 3.10 | 3.08 | 3.12 | 3.18 | 3.18 | 3.07 |
| 1905 | 3.30 | 3.30 | 2.95 | 2.98 | | | | | | | | | |
| 1906 | | | | | 2.78 | 2.80 | 2.88 | 2.98 | 2.92 | 2.90 | 2.88 | 2.92 | |
| 1907 | 3.00 | 3.30 | 3.50 | 3.48 | 3.48 | 3.50 | 3.50 | 3.50 | 3.92 | 4.35 | 4.48 | 4.68 | 3.72 |
| 1908 | 4.50 | 4.25 | 4.48 | 4.52 | 4.70 | 5.20 | 5.30 | 5.50 | 5.75 | 6.50 | 6.62 | 7.12 | 5.37 |
| 1909 | 4.25 | 4.32 | 4.75 | 4.75 | 4.08 | 4.65 | 4.08 | 4.55 | 4.42 | 4.25 | 4.05 | 3.98 | 4.44 |
| 1910 | 3.98 | 3.75 | 3.52 | 3.38 | 3.30 | 3.38 | 3.38 | 3.45 | 3.38 | 3.40 | 3.45 | 3.00 | 3.50 |
| 1911 | 3.75 | 3.68 | 3.85 | 4.08 | 4.12 | 4.12 | 4.08 | 4.10 | 4.30 | 4.58 | 4.72 | 4.00 | 4.16 |
| 1912 | 4.45 | 4.55 | 4.60 | 4.58 | 4.60 | 4.62 | 4.60 | 5.00 | 5.22 | 5.68 | 5.72 | 5.55 | 4.93 |
| 1913 | 5.35 | 5.30 | 4.94 | 4.95 | 5.25 | 5.25 | 5.30 | 5.12 | 4.95 | 4.92 | 4.92 | 5.62 | 5.16 |
| 1914 | 5.00 | 4.25 | 4.50 | 4.55 | 5.00 | 5.60 | 5.60 | 5.60 | 5.60 | 5.28 | 4.85 | 4.68 | 5.04 |
| 1915 | 4.55 | 5.05 | 5.82 | 6.25 | 6.38 | 6.38 | 6.38 | 6.45 | 6.95 | 9.38 | 10.50 | 8.75 | 6.90 |
| 1916 | 8.25 | 8.50 | 10.00 | 10.50 | 10.75 | 11.25 | 12.00 | 14.12 | 15.50 | 15.50 | 14.88 | 13.88 | 12.09 |
| 1917 | 13.25 | 12.88 | 12.38 | 12.00 | 11.88 | 12.38 | | 12.50 | 12.50 | 12.50 | 12.12 | 12.12 | |
| 1918 | 11.75 | 11.25 | 10.18 | 9.15 | 8.50 | 7.29 | 6.59 | 6.73 | 6.78 | 6.90 | 7.00 | 7.90 | 8.34 |
| 1919 | 7.50 | 6.73 | 6.32 | 6.30 | 6.64 | 6.53 | 6.40 | 5.94 | 6.20 | 6.40 | 6.29 | 5.72 | 6.41 |
| 1920 | 5.58 | 4.58 | 4.38 | 4.19 | 3.82 | 3.86 | 3.63 | 3.49 | 3.39 | 3.42 | 3.68 | 4.22 | 4.02 |
| 1921 | 4.55 | 4.68 | 4.79 | 4.79 | 4.89 | 5.25 | 6.05 | 6.50 | 6.58 | 6.59 | 7.39 | 6.33 | 5.70 |
| 1922 | 5.40 | 5.59 | 6.11 | 6.48 | 7.48 | 7.23 | 7.27 | 7.22 | 6.76 | 6.81 | 6.42 | 6.05 | 6.57 |
| 1923 | 6.75 | 6.05 | 6.09 | 5.92 | 5.92 | 6.18 | 6.03 | 6.02 | 6.04 | 6.29 | 7.04 | 7.29 | 6.33 |
| 1924 | 7.86 | 8.00 | 7.89 | 7.18 | 7.22 | 7.71 | 7.54 | 7.49 | 7.38 | 7.31 | 7.42 | 7.42 | 7.54 |
| 1925 | 7.32 | 6.20 | 5.71 | 5.98 | 6.26 | 6.25 | 6.57 | 5.87 | 5.62 | 5.57 | 5.83 | 5.95 | 6.04 |
| 1926 | 5.66 | 5.89 | 5.94 | 5.81 | 5.83 | 5.85 | 5.86 | 6.34 | 7.17 | 8.20 | 8.57 | 8.58 | 6.65 |
| 1927 | 7.75 | 5.60 | 5.88 | 5.80 | 6.21 | 6.66 | 8.42 | 9.20 | 9.28 | 9.03 | 8.75 | 8.36 | 7.58 |
| 1928 | 7.15 | 8.11 | 8.40 | 8.52 | 9.23 | 9.99 | 9.90 | 9.59 | 9.45 | 9.45 | 10.59 | | |
| 1929 | | 8.67 | 8.55 | 8.06 | | | | | | | | | |

LIMA, CALIFORNIA, NEW YORK

| Year beginning September | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Average |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1900 | | | | | 6.37 | 6.33 | 6.53 | 6.83 | 7.05 | 7.18 | 7.33 | 7.67 | |
| 1901 | | | 5.50 | 5.47 | 5.43 | 5.35 | 5.25 | 4.78 | 4.52 | 4.63 | 4.63 | 4.62 | |
| 1902 | 4.57 | 4.83 | 5.13 | 5.03 | 5.03 | 5.03 | 4.93 | 4.67 | 4.52 | 4.42 | 4.27 | 4.13 | 4.71 |
| 1903 | 4.18 | 4.07 | 3.75 | 3.75 | 3.85 | 4.10 | 4.13 | 4.00 | 3.98 | 3.97 | 4.08 | 4.25 | 4.01 |
| 1904 | 4.47 | 4.88 | 5.18 | 5.00 | 4.98 | 5.15 | 5.90 | 5.65 | 5.92 | 6.32 | 6.40 | 6.22 | 5.52 |
| 1905 | 6.27 | 4.78 | 4.57 | 5.03 | 5.62 | 5.63 | 5.43 | 5.23 | 5.27 | 5.10 | 5.03 | 4.77 | 5.23 |
| 1906 | 4.70 | 4.73 | 5.05 | 4.97 | 4.90 | 4.90 | 5.03 | 4.94 | 5.12 | 5.97 | 5.97 | 5.88 | 5.18 |
| 1907 | 6.60 | 6.45 | 5.95 | 6.10 | 5.92 | 5.58 | 5.47 | 5.47 | 5.53 | 5.72 | 5.63 | 5.63 | 5.84 |
| 1908 | 5.78 | 5.28 | 5.10 | 5.03 | 4.83 | 4.62 | 4.63 | 4.77 | 5.00 | 5.03 | 5.08 | 4.98 | 4.99 |
| 1909 | 5.02 | 5.02 | 5.05 | 4.88 | 4.87 | 4.97 | 4.95 | 5.02 | 5.00 | 5.08 | 5.17 | 5.23 | 5.02 |
| 1910 | 5.38 | 5.53 | 5.37 | 5.40 | 5.87 | 6.49 | 6.44 | 6.67 | 6.79 | 6.74 | 6.72 | 6.64 | 6.17 |
| 1911 | 6.58 | 5.96 | 6.11 | 6.55 | 6.51 | 6.52 | 6.74 | 6.71 | 6.49 | 6.24 | 6.15 | 6.18 | 6.40 |
| 1912 | 6.24 | 6.44 | 6.34 | 6.28 | 6.30 | 6.21 | 6.11 | 6.00 | 5.92 | 6.32 | 6.45 | 6.32 | 6.24 |
| 1913 | 6.18 | 6.11 | 6.03 | 5.97 | 5.91 | 5.98 | 6.43 | 7.26 | 7.28 | 7.33 | 7.48 | 8.10 | 6.67 |
| 1914 | 7.85 | 6.33 | 5.98 | 5.96 | 5.98 | 6.31 | 5.98 | 5.61 | 5.48 | 5.32 | 5.07 | 5.09 | 5.91 |
| 1915 | 5.26 | 5.40 | 5.60 | 5.47 | 5.28 | 5.18 | 5.22 | 5.40 | 5.48 | 5.86 | 7.36 | 6.71 | 5.68 |
| 1916 | 6.32 | 6.96 | 7.58 | 8.06 | 8.04 | 10.19 | 13.20 | 14.91 | 16.19 | 15.35 | 13.97 | 13.00 | 11.15 |
| 1917 | 13.35 | 14.97 | 14.62 | 13.52 | 13.12 | 13.86 | 14.36 | 14.03 | 13.38 | 12.70 | 12.94 | 13.60 | 13.70 |
| 1918 | 13.38 | 13.79 | 13.25 | 12.50 | 11.88 | 10.50 | 8.25 | 8.58 | 8.88 | 9.39 | 9.41 | 12.35 | 11.01 |
| 1919 | 12.44 | 14.16 | 13.98 | 14.41 | 14.45 | 14.31 | 12.13 | 11.84 | 11.95 | 12.57 | 12.84 | 12.46 | 13.13 |
| 1920 | 11.62 | 8.47 | 8.18 | 7.97 | 7.62 | 7.67 | 7.10 | 6.56 | 6.77 | 6.90 | 6.55 | 6.69 | 7.08 |
| 1921 | 6.79 | 6.65 | 7.05 | 7.32 | 7.40 | 8.88 | 9.66 | 9.68 | 10.00 | 10.18 | 10.82 | 9.84 | 8.64 |
| 1922 | 8.91 | 8.49 | 8.65 | 8.91 | 9.39 | 9.79 | 9.59 | 9.41 | 8.59 | 8.80 | 8.25 | 8.55 | 8.94 |
| 1923 | 9.40 | 9.84 | 10.41 | 10.09 | 10.81 | 11.30 | 12.40 | 12.68 | 12.48 | 12.59 | 12.62 | 13.04 | 11.47 |
| 1924 | 13.62 | 14.42 | 14.12 | 13.89 | 14.41 | 15.00 | 14.79 | 14.85 | 14.94 | 15.27 | 15.79 | 16.27 | 14.78 |
| 1925 | 15.92 | 14.11 | 13.24 | 11.88 | 11.83 | 12.06 | 11.20 | 10.13 | 9.15 | 8.88 | 8.76 | 8.55 | 11.51 |
| 1926 | 8.94 | 8.44 | 7.68 | 7.01 | 7.14 | 6.94 | 6.97 | 6.97 | 6.86 | 6.74 | 6.68 | 6.67 | 7.25 |
| 1927 | 6.96 | 6.97 | 6.85 | 6.83 | 7.00 | 7.87 | 8.33 | 9.06 | 9.09 | 9.75 | 9.90 | 10.17 | 8.28 |
| 1928 | 9.90 | 9.76 | 10.56 | 12.01 | 12.61 | 13.42 | 13.50 | 13.50 | 14.40 | 15.25 | 15.90 | 16.17 | 13.08 |
| 1929 | 16.76 | 14.39 | 13.27 | 12.95 | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from the Boston Produce Market Report, weekly; San Francisco Commercial News, daily; and New York Producers Price Current, daily.

TABLE 295.—*Soybeans: Acreage, production, and value, by States, 1928 and 1929*

| State | Total equivalent solid acres for all purposes | | | Total production | | | Acres from which gathered | | | Beans gathered | | | Farm price Dec. 1 of beans gathered | | | Total value of total production, except hay ¹ |
|---------------------|---|-------------|-------------|-----------------------------|---------|---------------|---|-------------|-------------|-------------------------|---------|---------------|-------------------------------------|-----------------|---------------|--|
| | Total acres, except hay ¹ | | | Yield per acre ² | | | Total production, except hay ² | | | Beans gathered per acre | | | Total quantity gathered | | | |
| | 1928 | 1929 | | 1928 | 1929 | | 1928 | 1929 | | 1928 | 1929 | | 1928 | 1929 | | |
| | 1,000 acres | 1,000 acres | 1,000 acres | Bushels | Bushels | 1,000 bushels | 1,000 acres | 1,000 acres | 1,000 acres | Bushels | Bushels | 1,000 bushels | Dolls. per bus. | Dolls. per bus. | 1,000 dollars | 1,000 dollars |
| New York..... | 3 | 3 | 58 | 70 | 15.0 | 1,015 | 37 | 49 | 15.0 | 14.5 | 555 | 710 | 1.95 | 1.75 | 1,696 | 1,776 |
| New Jersey..... | 9 | 8 | 125 | 167 | 14.5 | 870 | 68 | 100 | 14.5 | 14.2 | 1,000 | 1,420 | 1.60 | 1.55 | 2,899 | 3,675 |
| Pennsylvania..... | 186 | 331 | 220 | 270 | 16.5 | 3,630 | 186 | 240 | 16.5 | 16.5 | 3,006 | 3,960 | 1.40 | 1.50 | 5,082 | 6,082 |
| Ohio..... | 497 | 544 | 2 | 2 | 15.0 | 30 | 2 | 2 | 15.0 | 9.0 | 30 | 18 | 2.05 | 2.45 | 502 | 44 |
| Indiana..... | 12 | 10 | 3 | 3 | 12.5 | 38 | 2 | 1 | 12.5 | 11.0 | 23 | 11 | 2.55 | 2.55 | 97 | 56 |
| Illinois..... | 18 | 11 | 3 | 4 | 12.0 | 360 | 22 | 34 | 17.0 | 17.0 | 357 | 578 | 1.67 | 1.67 | 641 | 882 |
| Michigan..... | 65 | 36 | 30 | 44 | 12.5 | 1,438 | 103 | 161 | 12.5 | 10.0 | 1,288 | 1,010 | 1.95 | 1.95 | 2,732 | 3,393 |
| Wisconsin..... | 407 | 436 | 115 | 115 | 10.2 | 9.5 | 8 | 10 | 10.2 | 9.5 | 82 | 93 | 1.96 | 2.10 | 100 | 200 |
| Iowa..... | 13 | 18 | 8 | 10 | 10.2 | 270 | 168 | 15 | 18.0 | 10.5 | 270 | 168 | 1.95 | 2.15 | 405 | 361 |
| Missouri..... | 25 | 27 | 15 | 16 | 18.0 | 14.4 | 3 | 3 | 14.8 | 14.4 | 44 | 43 | 2.25 | 2.45 | 546 | 441 |
| Kansas..... | 121 | 115 | 21 | 20 | 13.0 | 9.0 | 273 | 14 | 13 | 13.0 | 9.0 | 182 | 2.00 | 2.45 | 117 | 124 |
| Delaware..... | 32 | 31 | 3 | 3 | 14.5 | 44 | 46 | 2 | 14.5 | 15.2 | 1,360 | 1,944 | 1.65 | 1.70 | 5,396 | 5,920 |
| Maryland..... | 370 | 218 | 250 | 27 | 15.0 | 4.0 | 406 | 120 | 11.5 | 8.0 | 8 | 30 | 2.40 | 2.40 | 832 | 972 |
| Virginia..... | 44 | 45 | 29 | 27 | 14.0 | 132 | 110 | 5 | 5.5 | 8.0 | 30 | 64 | 2.25 | 2.40 | 356 | 308 |
| North Carolina..... | 76 | 11 | 11 | 11 | 12.0 | 10.0 | 210 | 3 | 7.8 | 8.2 | 23 | 25 | 2.35 | 2.35 | 472 | 514 |
| South Carolina..... | 85 | 94 | 15 | 14 | 14.0 | 15.0 | 210 | 3 | 6.0 | 6.5 | 145 | 176 | 2.15 | 2.60 | 3,074 | 2,585 |
| Georgia..... | 325 | 329 | 130 | 110 | 11.0 | 1,112 | 1,126 | 23 | 6.0 | 5.5 | 18 | 11 | 2.35 | 2.35 | 3,472 | 3,328 |
| Kentucky..... | 59 | 59 | 8 | 9 | 14.0 | 14.0 | 136 | 2 | 8.4 | 8.4 | 17 | 54 | 2.30 | 2.85 | 1,569 | 2,155 |
| Tennessee..... | 58 | 69 | 44 | 56 | 15.5 | 13.5 | 682 | 12 | 10.0 | 10.0 | 120 | 140 | 2.40 | 2.65 | 1,224 | 1,707 |
| Alabama..... | 123 | 140 | 34 | 46 | 15.0 | 14.0 | 510 | 8 | 8.4 | 6.8 | 53 | 104 | 2.45 | 3.00 | 1,038 | 1,173 |
| Mississippi..... | 64 | 90 | 34 | 46 | 12.0 | 9.3 | 432 | 10 | 5.3 | 5.5 | 52 | 94 | 2.35 | 2.50 | 1,355 | 1,530 |
| Arkansas..... | 62 | 77 | 36 | 42 | 10.8 | 8.0 | 151 | 7 | 7.5 | 5.5 | 52 | 94 | 2.35 | 2.50 | 1,355 | 1,530 |
| Louisiana..... | 35 | 61 | 14 | 26 | 10.8 | 8.0 | 151 | 7 | 7.5 | 5.5 | 52 | 94 | 2.35 | 2.50 | 1,355 | 1,530 |
| Oklahoma..... | 2,865 | 3,190 | 1,144 | 1,373 | 14.2 | 16,256 | 656 | 892 | 13.4 | 12.8 | 8,819 | 11,432 | 1.80 | 1.87 | 29,180 | 33,979 |
| United States..... | 2,865 | 3,190 | 1,144 | 1,373 | 14.2 | 16,256 | 656 | 892 | 13.4 | 12.8 | 8,819 | 11,432 | 1.80 | 1.87 | 29,180 | 33,979 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Including acres planted in corn reduced to equivalent solid acres as well as the acreage grown alone.² Including beans grazed or otherwise utilized as well as those gathered.³ Acres from which all or part of the beans grown were gathered.⁴ Total production (except hay) multiplied by price of gathered beans to give approximate total value.

STATISTICS OF MISCELLANEOUS CROPS

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TABLE 296.—*Soybean oil: Quantity of beans used in production and quantity of crude oil produced, 1922-1928*

| Year beginning October | Soybeans crushed | | | | | Oil produced | | | | |
|---------------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | Oct.- Dec. | Jan.- Mar. | Apr.- June | July- Sept. | Total | Oct.- Dec. | Jan.- Mar. | Apr.- June | July- Sept. | Total |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1922..... | 2,708 | 3,876 | 2,350 | 597 | 9,528 | 364 | 758 | 272 | 78 | 1,482 |
| 1923..... | 2,230 | 3,232 | 504 | 102 | 6,128 | 286 | 388 | 72 | 13 | 759 |
| 1924..... | 3,550 | 7,478 | 3,038 | 4,320 | 18,402 | 477 | 870 | 360 | 562 | 2,269 |
| 1925..... | 5,480 | 7,746 | 7,450 | 358 | 21,040 | 728 | 990 | 874 | 46 | 2,634 |
| 1926..... | 5,132 | 6,804 | 6,032 | 2,104 | 20,072 | 735 | 862 | 776 | 286 | 2,659 |
| 1927..... | 8,788 | 10,278 | 8,792 | 5,654 | 33,512 | 1,164 | 1,289 | 1,132 | 780 | 4,374 |
| 1928..... | 11,480 | 21,190 | 9,666 | 10,560 | 52,896 | 1,506 | 3,083 | 1,277 | 1,456 | 7,322 |

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census, "Animal and vegetable fats and oils."

TABLE 297.—*Soybeans and soybean oil: International trade, years 1925-1928*

SOYBEANS

| Country | Year ended Dec. 31 | | | | | | | |
|----------------------------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-----------------|
| | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Principal exporting countries: | | | | | | | | |
| China ¹ | | 0 | 2,424,490 | | 0 | 2,605,554 | 0 | 3,376,789 |
| Principal importing countries: | | | | | | | | |
| Denmark..... | 250,149 | 0 | 385,051 | | 0 | 348,406 | 0 | 474,218 |
| Germany..... | 741,171 | | 815,787 | | 1,270,062 | | 1,808,891 | |
| Japan, including Chosen..... | 956,461 | 4,942 | 938,136 | 4,955 | 894,710 | 6,524 | 1,031,713 | 5,669 |
| Netherlands..... | 80,463 | 1,961 | 41,604 | 2,610 | 21,907 | 539 | 40,180 | 463 |
| Sweden..... | 123,012 | 0 | 139,474 | 0 | 150,749 | 0 | 199,528 | 0 |
| United Kingdom..... | 360,600 | 0 | 101,082 | 0 | 182,831 | 0 | 430,806 | 0 |
| United States ¹ | 3,812 | 0 | 3,728 | 0 | 4,189 | 0 | 4,256 | 0 |
| Total 8 countries..... | 2,515,668 | 2,431,293 | 2,422,952 | 2,613,119 | 2,862,854 | 3,383,852 | 4,049,652 | 6,132 |

SOYBEAN OIL

| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Principal exporting countries: | | | | | | | | |
| China..... | 0 | 265,240 | 0 | 353,631 | 0 | 329,288 | | |
| Denmark..... | 9,703 | 28,327 | 2,288 | 31,391 | 4,394 | 33,837 | 1,267 | 46,466 |
| Japan, including Chosen..... | 33 | 15,955 | 128 | 10,236 | 115 | 11,167 | | |
| Principal importing countries: | | | | | | | | |
| Algeria..... | 5,271 | 11 | 5,165 | 3 | 17,860 | 15 | 3,542 | |
| France..... | 14,787 | 58 | 13,057 | 67 | 22,986 | 81 | 19,990 | 241 |
| Germany..... | 73,793 | 6,314 | 44,094 | 11,160 | 25,090 | 34,663 | 2,466 | 73,140 |
| Netherlands..... | 84,792 | 27,963 | 100,709 | 37,447 | 168,388 | 75,314 | 91,249 | 35,509 |
| Sweden..... | 9,871 | 7,546 | 12,714 | 9,763 | 7,874 | 14,572 | 10,019 | 16,796 |
| United Kingdom..... | 65,200 | 42,399 | 108,067 | 55,019 | 118,075 | 63,025 | 55,196 | 48,919 |
| United States..... | 19,493 | 520 | 30,712 | 1,567 | 14,915 | 5,444 | 13,116 | 7,142 |
| Total 10 countries..... | 282,952 | 304,332 | 325,034 | 521,284 | 377,847 | 567,416 | 196,845 | 228,203 |

Bureau of Agricultural Economics. Compiled from official sources.

¹ These figures are for yellow beans, including mostly soybeans, according to Agricultural Commissioner Paul O. Nyhus.

² Imports for consumption.

TABLE 298.—*Soybeans: Estimated average price per bushel, received by producers, United States, 1913-1929*

| Year beginning October— | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Weighted average |
|-------------------------|----------------|----------------|----------------|----------------|----------------|------------------|
| | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| 1913 | 1.96 | 1.57 | 1.72 | 1.06 | 1.80 | 1.76 |
| 1914 | 2.08 | 2.15 | 2.24 | 2.35 | 2.26 | 2.18 |
| 1915 | 1.88 | 2.08 | 2.23 | 2.31 | 2.39 | 2.11 |
| 1916 | 2.13 | 2.13 | 2.18 | 2.20 | 2.45 | 2.16 |
| 1917 | 2.73 | 2.86 | 3.33 | 3.47 | 3.82 | 3.05 |
| 1918 | 3.36 | 3.20 | 3.20 | 3.00 | 3.00 | 3.23 |
| 1919 | 3.34 | 3.35 | 3.44 | 3.76 | 4.05 | 3.45 |
| 1920 | 3.41 | 3.00 | 2.28 | 2.18 | 2.17 | 2.80 |
| 1921 | 2.20 | 2.22 | 2.08 | 2.11 | 2.16 | 2.17 |
| 1922 | 1.89 | 2.06 | 1.97 | 2.07 | 2.13 | 2.00 |
| 1923 | 2.09 | 2.11 | 2.11 | 2.23 | 2.26 | 2.12 |
| 1924 | 2.23 | 2.16 | 2.36 | 2.59 | 2.64 | 2.29 |
| 1925 | 2.27 | 2.18 | 2.17 | 2.38 | 2.33 | 2.23 |
| 1926 | 1.97 | 1.85 | 1.83 | 1.90 | 2.03 | 1.89 |
| 1927 | 1.86 | 1.70 | 1.61 | 1.70 | 1.69 | 1.72 |
| 1928 | 1.72 | 1.69 | 1.70 | 1.82 | 1.93 | 1.72 |
| 1929 | 1.79 | 1.70 | 1.73 | 1.85 | | |

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices weighted by production of soybeans for each State; yearly price obtained by weighting monthly prices by estimated monthly marketings.

TABLE 299.—*Soybeans for seed: Average wholesale selling price per 100 pounds at Baltimore and St. Louis, 1920-1929*

| Year | Baltimore | | | | | | St. Louis | | | | | |
|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | Jan. | Feb. | Mar. | Apr. | May | Av. | Jan. | Feb. | Mar. | Apr. | May | Av. |
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1920 | 6.80 | 8.00 | 8.00 | 8.00 | 8.60 | 7.88 | 8.10 | 10.00 | 9.90 | 9.65 | 10.00 | 9.53 |
| 1921 | 3.15 | 3.50 | 3.50 | 3.75 | 4.70 | 3.72 | 4.30 | 5.40 | 5.75 | 5.00 | 5.40 | 5.17 |
| 1922 | 3.20 | 3.50 | 3.50 | 3.50 | 3.30 | 3.40 | 4.00 | 4.00 | 4.20 | 3.85 | 4.55 | 4.12 |
| 1923 | | 4.00 | 4.00 | 3.80 | 3.75 | | 5.00 | 4.75 | 4.50 | 4.50 | 4.95 | 4.74 |
| 1924 | 3.50 | 4.00 | 4.00 | 4.50 | 5.00 | 4.20 | 4.70 | 4.70 | 4.70 | 4.70 | 4.60 | 4.68 |
| 1925 | 5.10 | 4.90 | 5.25 | 4.95 | 3.95 | 4.83 | 4.00 | 4.00 | 4.00 | 3.75 | 3.60 | 3.87 |
| 1926 | 3.35 | 3.42 | 3.50 | 3.50 | 4.62 | 3.69 | 3.55 | 3.61 | 3.88 | 4.25 | 4.85 | 4.03 |
| 1927 | 3.00 | 3.00 | 3.00 | 3.00 | 3.12 | 3.02 | | 4.50 | 4.00 | 4.19 | 4.60 | |
| 1928 | 3.25 | 3.22 | 3.25 | 3.32 | 3.55 | 3.32 | 3.00 | 3.00 | 3.12 | 3.31 | 3.75 | 3.24 |
| 1929 | 3.75 | 4.00 | 4.00 | 4.00 | 4.50 | 4.05 | 4.25 | 4.25 | 4.38 | 4.62 | 4.75 | 4.45 |

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high quality seed.

TABLE 300.—*Soybean oil, crude, in barrels: Wholesale price per pound, Saturday nearest the 15th of the month, New York, 1910-1929¹*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1910 | 6.90 | 6.75 | 7.12 | 7.44 | 7.44 | 6.75 | 6.94 | 7.50 | 7.75 | 8.00 | 7.81 | 7.47 |
| 1911 | 7.38 | 7.88 | 7.56 | 7.00 | 7.00 | 6.25 | 6.38 | 6.44 | 6.69 | 7.62 | 7.00 | 6.88 |
| 1912 | 6.88 | 6.60 | 6.81 | 6.62 | | 6.40 | 6.62 | 6.56 | 6.56 | 6.62 | 6.50 | 6.00 |
| 1913 | 5.88 | 6.12 | 5.94 | 5.94 | 6.00 | 6.00 | 6.44 | 6.50 | 6.50 | 6.50 | 6.44 | 6.44 |
| 1914 | 6.44 | 6.62 | 6.38 | 6.38 | 6.38 | 6.25 | | | | 6.75 | 6.25 | |
| 1915 | | | 6.31 | 6.50 | 6.62 | 6.38 | 6.19 | 5.88 | 5.88 | 6.88 | 7.00 | 7.56 |
| 1916 | 8.19 | 8.56 | 9.38 | 9.38 | 9.12 | 8.12 | 7.88 | 7.88 | 8.50 | 10.00 | 11.31 | 11.87 |
| 1917 | 12.12 | 13.00 | 13.50 | 13.75 | 14.62 | 15.00 | 14.38 | 14.25 | 14.62 | 15.88 | 16.75 | 17.62 |
| 1918 | 18.25 | 18.88 | 19.25 | 19.62 | 19.12 | 18.38 | 18.25 | 18.25 | 18.38 | 18.38 | 17.25 | 17.00 |
| 1919 | 14.50 | 13.50 | 12.75 | 14.75 | 17.00 | 18.88 | 19.88 | 18.50 | 17.00 | 17.38 | 17.62 | 17.50 |
| 1920 | 10.50 | 18.25 | 18.62 | 18.00 | 17.75 | 17.00 | 15.50 | 14.00 | 13.50 | 12.62 | 11.75 | 9.00 |
| 1921 | 8.25 | 6.50 | 6.25 | 7.00 | 7.75 | 7.94 | 8.25 | 8.50 | 8.38 | 8.88 | 8.88 | 9.25 |
| 1922 | 8.88 | 9.12 | 10.88 | 11.38 | | | | | | 10.00 | 10.38 | 10.88 |
| 1923 | 11.19 | 11.69 | 12.62 | 13.12 | 13.12 | 12.62 | 11.88 | 11.62 | 11.62 | 10.88 | 11.00 | 11.38 |
| 1924 | 11.62 | 12.50 | 12.60 | 11.75 | 12.38 | 12.00 | 12.38 | 12.50 | 12.75 | 12.25 | 13.12 | 13.38 |
| 1925 | 13.25 | 13.25 | 13.25 | 13.38 | 13.38 | 13.38 | 13.38 | 13.38 | 13.38 | 13.38 | 13.38 | 13.38 |
| 1926 | 13.38 | 13.38 | 13.38 | 13.38 | 13.38 | 13.38 | 13.60 | 14.00 | 14.00 | 14.00 | 13.00 | 12.00 |
| 1927 | 12.00 | 12.12 | 12.12 | 12.12 | 12.38 | 12.12 | 12.12 | 12.12 | 12.12 | 13.25 | 12.12 | 12.12 |
| 1928 | 12.12 | 12.12 | 12.12 | 12.12 | 12.12 | 12.38 | 12.38 | 12.38 | 12.38 | 12.38 | 12.38 | 12.38 |
| 1929 | 12.38 | 12.38 | 12.38 | 12.00 | 11.75 | 11.75 | 11.75 | 11.12 | 11.12 | 12.62 | 12.62 | 12.25 |

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter.

¹ Prices through April, 1916, quoted as English; May, 1916-December, 1918, as Manchuria spot; beginning January, 1919, as crude.

TABLE 301.—*Cowpeas: Acreage, production, and value, by States, 1928 and 1929*

| State | Total equivalent solid acres for all purposes | | Total production | | | | | | Peas gathered | | | | | | Total value of total production except hay ⁴ | | |
|----------------|---|-------------|-------------------------------------|---------|-----------------------------|---------------|--|-------------|--|-------------|------------------------|---------------|-------------------------|-----------------|---|-----------------|------------------------------------|
| | | | Total acres except hay ¹ | | Yield per acre ² | | Total production except hay ³ | | Acres from which gathered ³ | | Peas gathered per acre | | Total quantity gathered | | | | Farm price Dec. 1 of peas gathered |
| | 1928 | 1929 | 1,000 acres | 1928 | 1929 | Bushels | 1,000 bushels | 1928 | 1929 | 1,000 acres | 1928 | 1929 | 1,000 bushels | 1928 | 1929 | Dollars per bu. | 1,000 dollars |
| | 1,000 acres | 1,000 acres | 1,000 acres | Bushels | Bushels | 1,000 bushels | 1,000 bushels | 1,000 acres | 1,000 acres | Bushels | Bushels | 1,000 bushels | 1,000 bushels | Dollars per bu. | Dollars | | |
| New Jersey | 1 | 1 | 2 | 2 | 13.0 | 30 | 2 | 2 | 2 | 15.0 | 15.0 | 30 | 30 | 2.40 | 2.65 | 72 | 80 |
| Ohio | 25 | 21 | 19 | 14 | 8.0 | 152 | 112 | 6 | 7 | 6.0 | 6.0 | 36 | 36 | 2.10 | 2.15 | 319 | 241 |
| Indiana | 57 | 35 | 48 | 39 | 8.0 | 384 | 314 | 47 | 47 | 11.0 | 9.5 | 282 | 282 | 1.85 | 1.85 | 710 | 710 |
| Illinois | 188 | 104 | 28 | 28 | 11.0 | 308 | 270 | 25 | 37 | 11.0 | 9.5 | 275 | 352 | 2.10 | 2.25 | 647 | 832 |
| Missouri | 107 | 75 | 3 | 3 | 8.5 | 27 | 28 | 3 | 3 | 9.0 | 8.5 | 27 | 26 | 2.30 | 2.40 | 62 | 62 |
| Kansas | 5 | 7 | 4 | 4 | 9.0 | 67 | 38 | 4 | 4 | 15.0 | 9.5 | 60 | 38 | 1.70 | 2.40 | 102 | 91 |
| Delaware | 6 | 5 | 2 | 2 | 13.0 | 40 | 20 | 2 | 2 | 6.0 | 10.0 | 18 | 20 | 2.30 | 2.45 | 41 | 49 |
| Maryland | 16 | 14 | 5 | 5 | 7.0 | 18 | 78 | 7 | 5 | 6.0 | 6.0 | 42 | 30 | 2.10 | 2.70 | 323 | 211 |
| Virginia | 108 | 65 | 22 | 13 | 7.0 | 154 | 78 | 7 | 7 | 6.0 | 6.0 | 42 | 30 | 2.10 | 2.70 | 323 | 211 |
| West Virginia | 2 | 12 | 124 | 68 | 9.0 | 1,116 | 816 | 53 | 50 | 6.5 | 9.0 | 344 | 450 | 1.95 | 2.30 | 2,176 | 1,877 |
| North Carolina | 209 | 112 | 334 | 229 | 6.0 | 1,374 | 1,116 | 128 | 118 | 3.0 | 4.5 | 384 | 522 | 1.55 | 2.30 | 2,130 | 2,656 |
| South Carolina | 334 | 368 | 172 | 172 | 9.5 | 1,634 | 1,068 | 108 | 124 | 5.0 | 6.2 | 540 | 769 | 1.65 | 2.30 | 2,696 | 2,226 |
| Georgia | 339 | 287 | 11 | 11 | 10.0 | 190 | 154 | 6 | 4 | 5.0 | 8.0 | 20 | 32 | 2.50 | 2.60 | 475 | 368 |
| Florida | 33 | 24 | 28 | 28 | 13.0 | 338 | 154 | 6 | 4 | 4.7 | 6.5 | 28 | 26 | 2.45 | 2.60 | 828 | 400 |
| Kentucky | 118 | 43 | 43 | 43 | 10.0 | 940 | 430 | 27 | 45 | 5.0 | 5.5 | 335 | 248 | 2.15 | 2.30 | 2,021 | 989 |
| Tennessee | 178 | 178 | 135 | 135 | 10.5 | 1,869 | 1,485 | 75 | 70 | 4.5 | 5.5 | 335 | 385 | 1.90 | 2.30 | 3,551 | 3,416 |
| Alabama | 228 | 178 | 114 | 94 | 11.0 | 940 | 600 | 46 | 45 | 4.5 | 5.3 | 207 | 244 | 1.95 | 2.40 | 1,883 | 2,160 |
| Mississippi | 152 | 114 | 73 | 63 | 12.0 | 861 | 630 | 48 | 55 | 3.1 | 2.5 | 149 | 138 | 1.95 | 2.40 | 1,679 | 1,512 |
| Arkansas | 171 | 147 | 32 | 32 | 12.5 | 538 | 336 | 27 | 23 | 5.0 | 4.0 | 135 | 172 | 2.25 | 2.65 | 1,237 | 980 |
| Louisiana | 184 | 138 | 48 | 47 | 13.0 | 637 | 470 | 26 | 26 | 9.0 | 6.0 | 234 | 197 | 2.30 | 2.45 | 1,433 | 1,152 |
| Oklahoma | 80 | 78 | 48 | 47 | 11.0 | 637 | 470 | 26 | 26 | 9.0 | 6.0 | 234 | 197 | 2.30 | 2.45 | 1,433 | 1,152 |
| Texas | 189 | 189 | 162 | 160 | 11.0 | 1,782 | 1,600 | 55 | 65 | 8.0 | 6.0 | 440 | 390 | 1.90 | 2.20 | 3,386 | 3,520 |
| United States | 2,987 | 2,117 | 1,391 | 1,059 | 9.6 | 13,352 | 10,149 | 699 | 735 | 5.3 | 5.8 | 3,724 | 4,269 | 1.93 | 2.31 | 23,721 | 23,442 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Including acres planted in corn reduced to equivalent solid acres as well as the acreage grown alone. Acreage cut for hay is included in table of legume hay.² Including peas grazed or otherwise utilized as well as those gathered.³ Acres from which all or part of the peas grown were gathered.⁴ Total production (except hay) multiplied by price of gathered peas to give approximate total value.

TABLE 302.—*Cowpeas: Estimated average price per bushel, received by producers, United States, 1915-1929*

| Year beginning August— | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Weighted average |
|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1915..... | 1.74 | 1.55 | 1.56 | 1.51 | 1.52 | 1.56 | 1.57 | 1.54 | 1.50 | 1.49 | 1.40 | 1.35 | 1.52 |
| 1916..... | 1.41 | 1.42 | 1.48 | 1.62 | 1.77 | 1.92 | 2.10 | 2.32 | 2.53 | 2.93 | 3.09 | 3.03 | 1.90 |
| 1917..... | 2.65 | 2.17 | 2.20 | 2.27 | 2.38 | 2.62 | 2.92 | 3.02 | 2.93 | 2.83 | 2.57 | 2.48 | 2.36 |
| 1918..... | 2.41 | 2.26 | 2.34 | 2.31 | 2.38 | 2.39 | 2.52 | 2.49 | 2.68 | 2.92 | 3.44 | 3.43 | 2.54 |
| 1919..... | 3.10 | 2.69 | 2.61 | 2.71 | 2.81 | 3.13 | 3.72 | 3.94 | 4.21 | 4.84 | 4.84 | 4.71 | 3.19 |
| 1920..... | 4.23 | 3.69 | 2.74 | 2.43 | 2.29 | 1.97 | 2.04 | 2.05 | 2.16 | 2.43 | 2.65 | 2.87 | 2.74 |
| 1921..... | 2.41 | 2.00 | 2.01 | 1.85 | 1.76 | 1.72 | 1.80 | 1.86 | 1.85 | 1.90 | 1.84 | 1.70 | 1.91 |
| 1922..... | 1.60 | 1.57 | 1.54 | 1.61 | 1.67 | 1.87 | 1.98 | 1.98 | 2.08 | 2.08 | 2.17 | 2.21 | 1.73 |
| 1923..... | 2.08 | 1.87 | 1.94 | 1.95 | 2.01 | 2.12 | 2.21 | 2.32 | 2.46 | 2.53 | 2.82 | 2.86 | 2.14 |
| 1924..... | 2.56 | 2.41 | 2.32 | 2.34 | 2.56 | 2.82 | 3.16 | 3.43 | 3.67 | 3.70 | 3.84 | 3.67 | 2.73 |
| 1925..... | 3.24 | 3.12 | 2.93 | 2.98 | 2.87 | 3.03 | 3.21 | 3.37 | 3.50 | 3.43 | 3.47 | 3.47 | 3.00 |
| 1926..... | 3.22 | 2.79 | 2.34 | 2.05 | 1.95 | 1.94 | 1.94 | 1.89 | 1.93 | 1.90 | 1.90 | 1.93 | 2.21 |
| 1927..... | 1.84 | 1.80 | 1.70 | 1.72 | 1.65 | 1.71 | 1.74 | 1.76 | 1.86 | 2.00 | 2.09 | 2.09 | 1.80 |
| 1928..... | 2.01 | 1.82 | 1.84 | 1.83 | 2.02 | 2.15 | 2.45 | 2.63 | 2.88 | 3.05 | 3.24 | 3.19 | 2.18 |
| 1929..... | 2.99 | 2.49 | 2.30 | 2.22 | 2.28 | 2.40 | | | | | | | |

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly price weighted by production of cowpeas for each State; yearly price obtained by weighting monthly prices by estimated monthly marketings.

TABLE 303.—*Cowpeas for seed: Average wholesale selling price per 100 pounds at Baltimore and St. Louis, 1920-1929*

| Year | Baltimore | | | | | | St. Louis | | | | | | Average |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | Jan. | Feb. | Mar. | Apr. | May | Average | Jan. | Feb. | Mar. | Apr. | May | Average | |
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1920..... | 7.20 | 9.00 | 9.00 | 9.00 | 9.60 | 8.76 | 10.50 | 12.75 | 11.25 | 10.65 | 11.00 | 11.23 | |
| 1921..... | 4.50 | 4.50 | 4.50 | 5.30 | 6.20 | 5.00 | 4.00 | 4.20 | 4.45 | 5.05 | 6.50 | 4.94 | |
| 1922..... | 3.70 | 4.00 | 4.00 | 4.00 | 4.00 | 3.94 | 3.20 | 3.15 | 3.65 | 3.75 | 3.75 | 3.50 | |
| 1923..... | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 | 5.00 | 4.95 | 4.75 | 4.75 | 4.95 | 4.88 | |
| 1924..... | 5.00 | 5.50 | 5.25 | 5.80 | 5.75 | 5.42 | 4.00 | 4.95 | 5.00 | 5.05 | 5.90 | 5.10 | |
| 1925..... | 6.50 | 6.50 | 6.50 | 6.50 | 6.55 | 6.51 | 6.50 | 6.70 | 6.80 | 6.80 | 6.80 | 6.72 | |
| 1926..... | | 7.08 | 7.10 | 7.05 | 7.02 | | 7.50 | 7.38 | 7.00 | 6.81 | 6.75 | 7.00 | |
| 1927..... | 3.75 | 3.75 | 3.56 | 3.50 | 3.50 | 3.61 | | 4.00 | 4.00 | 4.00 | 4.00 | | |
| 1928..... | 3.00 | 3.05 | 3.50 | 3.62 | 3.88 | 3.41 | 4.00 | 4.00 | 4.02 | 4.14 | 4.50 | 4.13 | |
| 1929..... | 4.75 | 5.88 | 6.25 | 6.25 | 6.25 | 5.88 | | 6.00 | 6.00 | 6.12 | 6.25 | | |

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high quality seed.

TABLE 304.—*Velvetbeans: Acreage, yield per acre, and production, by States, 1927-1929*

| State | Total acres for all purposes | | | Yield per acre of beans in the hull ¹ | | | Total production of beans in the hull ¹ | | |
|---------------------|------------------------------|--------------------|--------------------|--|---------------|---------------|--|-------------------|-------------------|
| | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 |
| | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>1,000 tons</i> | <i>1,000 tons</i> | <i>1,000 tons</i> |
| North Carolina..... | 8 | 11 | 14 | 1,300 | 1,300 | 1,300 | 5 | 7 | 9 |
| South Carolina..... | 73 | 67 | 82 | 1,075 | 800 | 1,000 | 39 | 27 | 41 |
| Georgia..... | 993 | 947 | 1,161 | 900 | 900 | 900 | 417 | 426 | 522 |
| Florida..... | 107 | 98 | 110 | 1,000 | 900 | 900 | 51 | 44 | 50 |
| Alabama..... | 360 | 375 | 430 | 1,000 | 900 | 700 | 150 | 169 | 170 |
| Mississippi..... | 26 | 33 | 40 | 1,000 | 1,250 | 1,480 | 13 | 21 | 30 |
| Louisiana..... | 27 | 27 | 28 | 1,350 | 1,400 | 1,450 | 18 | 19 | 16 |
| United States..... | 1,534 | 1,550 | 1,865 | 948.6 | 915.2 | 898.7 | 726 | 713 | 838 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ The figures refer to the yield and entire production of velvet beans in the hull and not merely to those gathered. The pods are gathered from one-fourth to one-third of the acreage and most of these are ground for feed, only enough being shelled to supply seed. A large proportion of the crop is grazed.

TABLE 305.—*Broomcorn: Acreage, production, and November 15 price, United States, 1915-1929*

| Year | Acreage | Average yield per acre | Production | Price per ton received by producers Nov. 15 | Year | Acreage | Average yield per acre | Production | Price per ton received by producers Nov. 15 |
|-----------|--------------|------------------------|-------------|---|-------------------------|--------------|------------------------|-------------|---|
| | <i>Acres</i> | <i>Pounds</i> | <i>Tons</i> | <i>Dollars</i> | | <i>Acres</i> | <i>Pounds</i> | <i>Tons</i> | <i>Dollars</i> |
| 1915..... | 230,100 | 454.1 | 52,242 | 91.67 | 1923..... | 536,000 | 302.8 | 81,153 | 160.05 |
| 1916..... | 233,200 | 329.3 | 38,726 | 172.75 | 1924..... | 430,000 | 356.7 | 77,800 | 95.81 |
| 1917..... | 345,000 | 332.8 | 57,400 | 292.75 | 1925..... | 214,000 | 275.7 | 29,500 | ¹ 143.02 |
| 1918..... | 366,000 | 340.4 | 62,300 | 233.87 | 1926..... | 306,000 | 355.6 | 54,400 | ² 78.77 |
| 1919..... | 352,000 | 303.4 | 53,400 | 154.57 | 1927..... | 237,000 | 337.6 | 40,000 | ² 100.50 |
| 1920..... | 275,500 | 265.0 | 36,500 | 126.16 | 1928..... | 298,000 | 363.1 | 54,100 | ² 104.21 |
| 1921..... | 222,000 | 344.2 | 38,200 | 72.20 | 1929 ³ | 284,000 | 308.5 | 43,800 | ² 121.80 |
| 1922..... | 275,000 | 271.3 | 37,300 | 219.46 | | | | | |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Weighted average of the season to Dec. 1.² Dec. 1 price.³ Preliminary.TABLE 306.—*Broomcorn: Acreage, production, and December 1 price, by States, 1926-1929*

| State | Acreage | | | | Average yield per acre | | | | Production | | | | Price per ton received by producers Dec. 1 | | | |
|-------------|--------------------|--------------------|--------------------|--------------------|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------|--|---------------|---------------|-------------------|
| | 1926 | 1927 | 1928 | 1929 ¹ | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 ¹ | 1926 | 1927 | 1928 | 1929 ¹ |
| | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Lbs.</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Tons</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| Ill..... | 40 | 28 | 21 | 21 | 420 | 380 | 440 | 425 | 8,400 | 5,300 | 4,600 | 4,500 | 115 | 155 | 145 | 175 |
| Mo..... | 3 | 3 | 4 | 4 | 250 | 400 | 430 | 380 | 400 | 600 | 900 | 800 | 87 | 90 | 90 | 100 |
| Kans..... | 31 | 27 | 43 | 42 | 327 | 375 | 450 | 340 | 5,100 | 5,100 | 9,700 | 7,100 | 85 | 96 | 96 | 115 |
| Okla..... | 158 | 112 | 131 | 115 | 375 | 349 | 350 | 262 | 29,600 | 19,500 | 22,900 | 15,100 | 70 | 98 | 111 | 120 |
| Tex..... | 15 | 10 | 9 | 7 | 410 | 260 | 311 | 350 | 3,100 | 1,300 | 1,400 | 1,200 | 75 | 110 | 107 | 112 |
| Colo..... | 30 | 35 | 52 | 55 | 225 | 330 | 360 | 330 | 3,400 | 5,800 | 9,100 | 9,100 | 83 | 120 | 85 | 112 |
| N. Mex..... | 29 | 22 | 38 | 40 | 360 | 220 | 272 | 300 | 4,400 | 2,400 | 5,200 | 6,000 | 60 | 110 | 90 | 115 |
| U. S..... | 366 | 237 | 298 | 284 | 355.6 | 337.6 | 363.1 | 308.5 | 54,400 | 40,000 | 54,100 | 43,800 | 78.77 | 109.50 | 104.21 | 121.80 |

Bureau of Agricultural Economics. Estimates of the crop reporting board.

¹ Preliminary.TABLE 307.—*Broomcorn: Supply and distribution, 1923-1929*

Crop year June 1 to May 31

| | 1923-24 | 1924-25 | 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30 ¹ |
|-----------------------------|--------------------|---------------------|------------------|------------------|---------|------------------|----------------------|
| Supply: | | | | | | | |
| Stocks June 1— | | | | | | | |
| Manufacturers..... | ¹ 8,018 | 15,160 | 20,960 | 16,201 | 18,173 | 18,744 | 19,501 |
| Dealers ² | 2,421 | 15,489 | 25,043 | 9,706 | 11,498 | 5,938 | 7,495 |
| On farms..... | (³) | 6,133 | 6,024 | 3,265 | 2,709 | 1,206 | 823 |
| Total carry-over..... | 10,439 | 36,791 | 52,027 | 29,172 | 32,380 | 25,888 | 27,900 |
| Production..... | 81,153 | 78,200 | 29,500 | 54,400 | 40,000 | 54,500 | 446,200 |
| Imports..... | 550 | 136 | (⁴) | (⁴) | 193 | (⁴) | (⁴) |
| Total supply available..... | 92,142 | 115,127 | 81,527 | 83,572 | 72,573 | 80,388 | 474,100 |
| Distribution: | | | | | | | |
| Exports ⁵ | 5,009 | 5,580 | 4,688 | 4,791 | 4,367 | 4,931 | ..... |
| Domestic use..... | 50,252 | ⁶ 57,520 | 47,667 | 46,491 | 42,318 | 47,458 | |
| Stocks on hand May 31..... | 36,791 | 52,027 | 20,172 | 32,380 | 25,888 | 27,900 | |

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¹ In June, 1923, about 30 per cent of the manufacturers reported idle account lack of working stocks.² Storage stocks reported by dealers include manufacturers' stocks held by dealers at country shipping points.³ Less than 100 tons.⁴ Oct. 1 estimate.⁵ For crop year, June 1-May 31.⁶ Includes waste and broomcorn destroyed by warehouse fire.

| | 3 | 4 | 2 | 313 | 376 | 229 | 376 | 313 | 2 | 4 | 3 |
|---------------------|--------|--------|--------|---------|--------|--------|--------|---------|--------|--------|--------|
| | 3 | 15 | 13 | 423 | 480 | 407 | 480 | 423 | 13 | 15 | 3 |
| | 3 | 3 | 4 | 61 | 64 | 73 | 64 | 61 | 4 | 3 | 3 |
| South Carolina..... | 128 | 134 | 124 | 4,860 | 5,212 | 4,343 | 5,212 | 4,860 | 124 | 134 | 128 |
| Florida..... | | | | | | | | | | | |
| Georgia..... | | | | | | | | | | | |
| South Atlantic..... | | | | | | | | | | | |
| Kentucky..... | 30 | 81 | 30 | 1,763 | 1,631 | 1,536 | 1,631 | 1,763 | 30 | 81 | 30 |
| Tennessee..... | 51 | 60 | 51 | 1,933 | 1,690 | 1,515 | 1,690 | 1,933 | 51 | 60 | 51 |
| Alabama..... | 16 | 16 | 16 | 453 | 457 | 480 | 457 | 453 | 16 | 16 | 16 |
| Mississippi..... | 34 | 35 | 34 | 559 | 581 | 480 | 581 | 559 | 34 | 35 | 34 |
| Arkansas..... | 111 | 111 | 126 | 631 | 683 | 647 | 683 | 631 | 126 | 111 | 121 |
| Louisiana..... | 18 | 25 | 18 | 326 | 424 | 272 | 424 | 326 | 18 | 25 | 26 |
| Oklahoma..... | 482 | 492 | 473 | 875 | 841 | 871 | 841 | 875 | 473 | 482 | 489 |
| Texas..... | 208 | 208 | 207 | 744 | 733 | 779 | 733 | 744 | 207 | 208 | 246 |
| South Central..... | 1,021 | 1,028 | 955 | 7,284 | 7,040 | 6,686 | 7,040 | 7,284 | 955 | 1,028 | 1,021 |
| Montana..... | 477 | 545 | 619 | 2,050 | 2,538 | 2,216 | 2,538 | 2,050 | 619 | 545 | 477 |
| Idaho..... | 121 | 121 | 124 | 751 | 2,635 | 2,836 | 2,635 | 751 | 124 | 121 | 121 |
| Wyoming..... | 381 | 431 | 379 | 1,136 | 2,224 | 1,231 | 2,224 | 1,136 | 379 | 431 | 381 |
| Colorado..... | 496 | 358 | 374 | 2,677 | 2,467 | 2,397 | 2,467 | 2,677 | 374 | 358 | 496 |
| New Mexico..... | 30 | 30 | 30 | 447 | 407 | 397 | 407 | 447 | 30 | 30 | 30 |
| Arizona..... | 11 | 11 | 11 | 679 | 697 | 666 | 697 | 679 | 11 | 11 | 11 |
| Utah..... | 128 | 100 | 115 | 1,500 | 1,400 | 1,312 | 1,400 | 1,500 | 115 | 100 | 128 |
| Nevada..... | 142 | 162 | 168 | 1,496 | 1,541 | 1,501 | 1,541 | 1,496 | 168 | 162 | 142 |
| Washington..... | 38 | 46 | 42 | 1,875 | 2,140 | 2,105 | 2,140 | 1,875 | 42 | 46 | 38 |
| Oregon..... | 282 | 282 | 237 | 1,835 | 2,041 | 1,863 | 2,041 | 1,835 | 237 | 282 | 282 |
| California..... | 158 | 180 | 157 | 5,178 | 5,104 | 5,063 | 5,104 | 5,178 | 157 | 180 | 158 |
| Far Western..... | 2,193 | 2,260 | 2,261 | 20,784 | 21,224 | 21,064 | 21,224 | 20,784 | 2,261 | 2,260 | 2,193 |
| United States..... | 12,924 | 12,915 | 14,368 | 101,715 | 93,351 | 92,810 | 93,351 | 101,715 | 14,368 | 12,915 | 12,924 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

1 Preliminary.

TABLE 309.—*Hay: Acreage, production, December 1 price, exports, etc., United States, 1909-1929*

| Year | Tame hay | | | | | | Wild hay | | | |
|-------------------------|-------------|------------------------|------------------|---|--|---|-------------|----------------|------------------|---|
| | Acreage | Average yield per acre | Production | Price per ton received by producers, Dec. 1 | Domestic exports, year beginning July 1 ¹ | Imports, year beginning July 1 ¹ | Acreage | Yield per acre | Production | Price per ton received by producers, Dec. 1 |
| | 1,000 acres | Short tons | 1,000 short tons | Dollars | 1,000 short tons | 1,000 short tons | 1,000 acres | Short tons | 1,000 short tons | Dollars |
| 1909..... | 51,041 | 1.55 | 68,835 | ..... | 62 | 108 | 17,187 | 1.07 | 18,383 | ..... |
| 1909..... | 51,041 | 1.46 | 74,381 | 10.58 | 62 | 377 | 17,187 | .77 | 13,151 | ..... |
| 1910..... | 51,015 | 1.36 | 69,378 | 12.14 | 67 | 783 | 17,187 | .71 | 12,155 | ..... |
| 1911..... | 48,240 | 1.14 | 54,916 | 14.29 | 68 | 175 | 17,427 | 1.04 | 18,043 | ..... |
| 1912..... | 49,530 | 1.47 | 72,691 | 11.79 | 56 | 191 | 16,341 | .92 | 15,063 | ..... |
| 1913..... | 48,954 | 1.31 | 64,116 | 12.43 | 118 | 23 | 16,752 | 1.11 | 18,615 | 7.49 |
| 1914..... | 49,145 | 1.43 | 70,071 | 11.12 | 200 | 48 | 16,796 | 1.27 | 21,343 | 6.89 |
| 1915..... | 51,108 | 1.68 | 85,920 | 10.63 | 96 | 65 | 16,635 | 1.10 | 19,800 | 7.99 |
| 1916..... | 55,721 | 1.64 | 91,192 | 11.22 | 34 | 460 | 16,212 | .93 | 15,131 | 13.49 |
| 1917..... | 55,203 | 1.51 | 83,308 | 17.09 | 32 | 311 | 15,365 | .94 | 14,179 | 15.23 |
| 1918..... | 55,755 | 1.37 | 76,660 | 20.13 | ..... | ..... | ..... | ..... | ..... | ..... |
| 1919..... | 55,653 | 1.84 | 74,734 | ..... | 67 | 252 | 17,150 | 1.07 | 18,401 | 16.59 |
| 1919..... | 56,888 | 1.53 | 86,997 | 20.05 | 55 | 126 | 15,787 | 1.11 | 17,460 | 11.35 |
| 1920..... | 58,101 | 1.55 | 89,785 | 17.06 | 61 | 5 | 15,632 | .98 | 15,391 | 6.63 |
| 1921..... | 58,769 | 1.40 | 82,458 | 12.10 | 53 | 35 | 15,871 | 1.02 | 16,131 | 7.14 |
| 1922..... | 61,159 | 1.57 | 95,748 | 12.55 | 24 | 403 | 15,556 | 1.12 | 17,361 | 7.93 |
| 1923..... | 59,868 | 1.49 | 89,250 | 14.13 | ..... | ..... | ..... | ..... | ..... | ..... |
| 1924..... | 59,073 | ..... | ..... | ..... | 25 | 119 | 15,205 | .98 | 11,859 | 7.83 |
| 1924..... | 60,907 | 1.60 | 97,224 | 13.76 | 18 | 431 | 14,560 | .87 | 12,724 | 8.53 |
| 1925..... | 58,013 | 1.47 | 85,431 | 13.93 | 15 | 209 | 12,911 | .74 | 9,568 | 10.05 |
| 1926..... | 58,558 | 1.47 | 86,144 | 14.10 | 17 | 84 | 14,813 | 1.17 | 17,326 | 6.59 |
| 1927..... | 60,885 | 1.74 | 106,001 | 11.35 | 14 | 40 | 13,138 | .98 | 12,915 | 7.35 |
| 1928..... | 58,140 | 1.61 | 93,351 | 12.27 | ..... | ..... | 14,125 | .91 | 12,921 | 8.11 |
| 1929 ² | 60,996 | 1.67 | 101,715 | 12.23 | ..... | ..... | ..... | ..... | ..... | ..... |

Bureau of Agricultural Economics. Italic figures are census returns; other acreage, production, and yield figures are estimates of the crop-reporting board. See 1927 Yearbook, p. 927, for data for earlier years.

¹ Compiled from Commerce and Navigation of the United States, 1910-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1926; January and June issues, 1927-1929 and official records of the Bureau of Foreign and Domestic Commerce.

² Preliminary.

TABLE 310.—*Hay: Production of alfalfa, timothy, and mixed, by States, 1927-1929*

| State and division | Alfalfa hay | | | Timothy hay | | | Clover and timothy hay mixed | | |
|---------------------|-------------|------------|-------------------|-------------|------------|-------------------|------------------------------|------------|-------------------|
| | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 ¹ |
| | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons |
| Maine..... | 8 | 9 | 6 | 174 | 185 | 173 | 781 | 804 | 815 |
| New Hampshire..... | 8 | 8 | 7 | 62 | 63 | 60 | 230 | 265 | 262 |
| Vermont..... | 20 | 18 | 20 | 204 | 217 | 212 | 874 | 919 | 977 |
| Massachusetts..... | 9 | 9 | 7 | 90 | 96 | 80 | 211 | 231 | 200 |
| Rhode Island..... | | | | 7 | 6 | 6 | 23 | 23 | 22 |
| Connecticut..... | 16 | 17 | 16 | 61 | 65 | 52 | 120 | 122 | 120 |
| New York..... | 569 | 541 | 516 | 1,617 | 1,412 | 1,403 | 3,532 | 2,949 | 2,874 |
| New Jersey..... | 69 | 60 | 49 | 88 | 80 | 63 | 239 | 230 | 184 |
| Pennsylvania..... | 208 | 218 | 211 | 1,736 | 1,466 | 1,162 | 2,408 | 2,347 | 2,289 |
| North Atlantic..... | 907 | 889 | 862 | 4,039 | 3,595 | 3,211 | 8,520 | 7,890 | 7,743 |
| Ohio..... | 411 | 344 | 407 | 1,587 | 1,211 | 1,330 | 2,030 | 1,352 | 2,021 |
| Indiana..... | 356 | 336 | 402 | 668 | 721 | 507 | 922 | 640 | 942 |
| Illinois..... | 338 | 480 | 586 | 950 | 658 | 660 | 1,334 | 1,049 | 1,611 |
| Michigan..... | 1,103 | 1,140 | 1,234 | 508 | 110 | 381 | 2,053 | 1,783 | 2,150 |
| Wisconsin..... | 780 | 518 | 922 | 584 | 635 | 501 | 3,401 | 2,498 | 3,382 |
| Minnesota..... | 1,511 | 1,500 | 1,531 | 493 | 337 | 338 | 1,480 | 1,132 | 1,260 |
| Iowa..... | 843 | 958 | 1,271 | 710 | 679 | 678 | 2,140 | 1,621 | 2,678 |
| Missouri..... | 415 | 382 | 397 | 1,432 | 1,121 | 1,140 | 1,506 | 1,286 | 1,525 |
| North Dakota..... | 413 | 510 | 384 | 99 | 78 | 49 | 55 | 38 | 34 |
| South Dakota..... | 1,665 | 1,125 | 1,430 | 78 | 51 | 44 | 71 | 52 | 82 |
| Nebraska..... | 3,207 | 2,633 | 2,759 | 36 | 27 | 28 | 100 | 103 | 106 |
| Kansas..... | 2,824 | 2,250 | 1,747 | 142 | 113 | 79 | 106 | 93 | 71 |
| North Central..... | 14,189 | 12,266 | 13,260 | 7,307 | 6,079 | 5,788 | 15,247 | 11,599 | 15,961 |
| Delaware..... | 14 | 17 | 11 | 14 | 15 | 11 | 50 | 46 | 36 |
| Maryland..... | 60 | 62 | 50 | 106 | 98 | 89 | 309 | 319 | 291 |
| Virginia..... | 108 | 122 | 127 | 192 | 191 | 181 | 409 | 400 | 394 |
| West Virginia..... | 16 | 18 | 20 | 348 | 302 | 247 | 516 | 502 | 522 |
| North Carolina..... | 11 | 18 | 20 | 21 | 23 | 22 | 49 | 47 | 50 |
| South Carolina..... | 3 | 6 | 5 | | | | | | |
| Georgia..... | 6 | 8 | 7 | 2 | 2 | 3 | 2 | 2 | 3 |
| South Atlantic..... | 218 | 251 | 249 | 683 | 631 | 553 | 1,365 | 1,316 | 1,296 |
| Kentucky..... | 143 | 142 | 155 | 241 | 173 | 150 | 296 | 231 | 322 |
| Tennessee..... | 37 | 33 | 42 | 122 | 121 | 133 | 302 | 289 | 345 |
| Alabama..... | 22 | 22 | 22 | | | | | | |
| Mississippi..... | 23 | 68 | 88 | | | | 7 | 8 | 6 |
| Arkansas..... | 60 | 115 | 94 | 35 | 22 | 24 | 96 | 65 | 76 |
| Louisiana..... | 36 | 41 | 40 | | | | | | |
| Oklahoma..... | 464 | 402 | 442 | 17 | 15 | 14 | 14 | 14 | 12 |
| Texas..... | 161 | 152 | 179 | | | | | | |
| South Central..... | 949 | 975 | 1,062 | 415 | 331 | 321 | 715 | 607 | 761 |
| Montana..... | 1,775 | 1,619 | 1,376 | 162 | 159 | 111 | 300 | 292 | 208 |
| Idaho..... | 2,439 | 1,983 | 2,061 | 108 | 81 | 84 | 234 | 213 | 205 |
| Wyoming..... | 795 | 798 | 806 | 41 | 39 | 38 | 129 | 118 | 118 |
| Colorado..... | 2,047 | 1,806 | 1,962 | 68 | 56 | 60 | 218 | 228 | 252 |
| New Mexico..... | 322 | 305 | 331 | 8 | 6 | 6 | 7 | 6 | 8 |
| Arizona..... | 588 | 630 | 615 | | | | | | |
| Utah..... | 1,360 | 1,275 | 1,304 | 16 | 13 | 16 | 44 | 42 | 51 |
| Nevada..... | 409 | 441 | 397 | 15 | 15 | 15 | 21 | 21 | 23 |
| Washington..... | 858 | 874 | 715 | 159 | 162 | 181 | 382 | 353 | 298 |
| Oregon..... | 792 | 777 | 672 | 32 | 28 | 28 | 141 | 138 | 133 |
| California..... | 4,261 | 4,246 | 4,175 | 6 | 6 | 6 | 30 | 34 | 34 |
| Far western..... | 15,560 | 14,754 | 14,474 | 614 | 508 | 495 | 1,506 | 1,471 | 1,330 |
| United States..... | 31,823 | 29,135 | 29,947 | 13,058 | 11,204 | 10,338 | 27,353 | 22,874 | 26,961 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.

TABLE 311.—*Hay, tame, by kinds: Acreage, yield per acre, and production, United States, 1919-1929*

ACREAGE

| All Year | Alfalfa | Clover (red, alsike, and crimson) | Sweet clover | Lespedeza (Japan clover) | Clover and timothy mixed | Timothy | Grains cut green | Annual legumes | Millet, Johnson, Sudan grass and other | All tame |
|-------------------------|-------------|-----------------------------------|--------------|--------------------------|--------------------------|-------------|------------------|----------------|--|-------------|
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres |
| 1919..... | 8,750 | 17,434 | ----- | ----- | 14,739 | 11,398 | 5,266 | 2,619 | 6,682 | 56,888 |
| 1920..... | 9,131 | 17,659 | ----- | ----- | 15,632 | 11,416 | 4,704 | 2,756 | 6,803 | 58,101 |
| 1921..... | 9,228 | 17,637 | ----- | ----- | 15,430 | 11,489 | 4,925 | 3,048 | 7,012 | 58,769 |
| 1922..... | 9,368 | 19,079 | ----- | ----- | 16,100 | 11,409 | 4,560 | 3,510 | 7,133 | 61,159 |
| 1923..... | 9,816 | 18,091 | ----- | ----- | 15,596 | 11,104 | 4,295 | 3,828 | 7,138 | 59,868 |
| 1924..... | 10,759 | 7,412 | 790 | 344 | 17,476 | 9,566 | 3,278 | 3,710 | 7,572 | 60,907 |
| 1925..... | 10,852 | 6,927 | 921 | 300 | 16,684 | 8,783 | 3,319 | 3,053 | 7,174 | 58,013 |
| 1926..... | 11,076 | 5,637 | 1,029 | 330 | 15,762 | 9,561 | 4,320 | 3,370 | 7,473 | 58,558 |
| 1927..... | 11,401 | 6,689 | 1,128 | 361 | 16,825 | 9,116 | 3,133 | 4,344 | 7,888 | 60,885 |
| 1928..... | 11,067 | 5,081 | 1,212 | 366 | 16,009 | 8,979 | 2,927 | 4,427 | 8,072 | 58,140 |
| 1929 ¹ | 11,505 | 7,526 | 1,298 | 361 | 16,758 | 7,733 | 3,526 | 4,078 | 8,211 | 60,906 |

YIELD PER ACRE

| | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons |
|-------------------------|------|------|-------|-------|------|------|------|------|------|------|
| 1919..... | 2.56 | 1.48 | ----- | ----- | 1.44 | 1.34 | 1.12 | 0.99 | 1.28 | 1.53 |
| 1920..... | 2.71 | 1.42 | ----- | ----- | 1.37 | 1.33 | 1.31 | 1.06 | 1.24 | 1.55 |
| 1921..... | 2.57 | 1.21 | ----- | ----- | 1.17 | 1.17 | 1.31 | .99 | 1.21 | 1.40 |
| 1922..... | 2.61 | 1.50 | ----- | ----- | 1.47 | 1.33 | 1.25 | 1.09 | 1.31 | 1.57 |
| 1923..... | 2.65 | 1.33 | ----- | ----- | 1.30 | 1.15 | 1.37 | 1.05 | 1.34 | 1.49 |
| 1924..... | 2.49 | 1.61 | 1.80 | 0.94 | 1.58 | 1.38 | 1.14 | .88 | 1.20 | 1.60 |
| 1925..... | 2.62 | 1.38 | 1.73 | .88 | 1.27 | 1.07 | 1.46 | .85 | 1.09 | 1.47 |
| 1926..... | 2.48 | 1.38 | 1.53 | 1.18 | 1.30 | 1.16 | 1.18 | 1.09 | 1.14 | 1.47 |
| 1927..... | 2.79 | 1.75 | 2.02 | 1.30 | 1.63 | 1.43 | 1.49 | 1.10 | 1.25 | 1.74 |
| 1928..... | 2.63 | 1.58 | 2.05 | 1.25 | 1.43 | 1.25 | 1.44 | 1.15 | 1.22 | 1.61 |
| 1929 ¹ | 2.59 | 1.78 | 1.81 | 1.17 | 1.61 | 1.34 | 1.28 | 1.06 | 1.16 | 1.67 |

PRODUCTION

| | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons |
|-------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1919..... | 22,364 | 11,030 | ----- | ----- | 21,282 | 15,238 | 5,909 | 2,599 | 8,575 | 86,997 |
| 1920..... | 24,758 | 10,864 | ----- | ----- | 21,407 | 15,211 | 6,177 | 2,925 | 8,443 | 89,785 |
| 1921..... | 23,705 | 9,237 | ----- | ----- | 18,028 | 13,486 | 6,475 | 3,020 | 8,507 | 82,458 |
| 1922..... | 24,434 | 11,603 | ----- | ----- | 23,649 | 15,176 | 5,715 | 3,813 | 9,358 | 95,748 |
| 1923..... | 25,990 | 10,789 | ----- | ----- | 20,216 | 12,776 | 5,876 | 4,037 | 9,566 | 89,250 |
| 1924..... | 26,786 | 11,935 | 1,420 | 325 | 27,528 | 13,179 | 3,734 | 3,267 | 9,050 | 97,224 |
| 1925..... | 28,439 | 9,201 | 1,594 | 263 | 21,271 | 9,400 | 4,835 | 2,593 | 7,835 | 85,431 |
| 1926..... | 27,505 | 7,769 | 1,574 | 390 | 20,520 | 11,073 | 5,107 | 3,669 | 8,537 | 86,144 |
| 1927..... | 31,823 | 11,727 | 2,274 | 469 | 27,353 | 13,054 | 4,655 | 4,787 | 9,855 | 106,001 |
| 1928..... | 29,135 | 8,047 | 2,483 | 457 | 22,874 | 11,204 | 4,202 | 5,102 | 9,847 | 93,351 |
| 1929 ¹ | 29,847 | 13,390 | 2,350 | 422 | 26,991 | 10,338 | 4,522 | 4,323 | 9,532 | 101,715 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ All clover hay.² Preliminary.TABLE 312.—*Hay, all: Stocks on farms, United States, May 1, 1910-1929*

| Year | Production of all hay preceding year | Stocks on farms May 1 | | Price per ton May 1 ¹ | Year | Production of all hay preceding year | Stocks on farms May 1 | | Price per ton May 1 ¹ |
|-----------|--------------------------------------|-----------------------|------------------|----------------------------------|-----------|--------------------------------------|-----------------------|------------------|----------------------------------|
| | 1,000 short tons | Per cent | 1,000 short tons | Dollars | | 1,000 short tons | Per cent | 1,000 short tons | Dollars |
| 1910..... | 92,767 | 11.6 | 10,745 | 11.08 | 1920..... | 108,898 | 10.2 | 10,707 | 24.22 |
| 1911..... | 82,529 | 12.4 | 10,222 | 11.69 | 1921..... | 107,245 | 17.9 | 19,160 | 13.08 |
| 1912..... | 67,071 | 8.5 | 5,732 | 16.31 | 1922..... | 97,849 | 11.2 | 10,969 | 12.98 |
| 1913..... | 90,734 | 14.9 | 13,523 | 10.42 | 1923..... | 111,879 | 12.0 | 13,379 | 12.69 |
| 1914..... | 79,179 | 12.2 | 9,631 | 11.63 | 1924..... | 106,611 | 12.0 | 12,835 | 13.69 |
| 1915..... | 88,686 | 12.2 | 10,797 | 11.03 | 1925..... | 112,083 | 13.9 | 15,598 | 12.32 |
| 1916..... | 107,263 | 13.5 | 14,452 | 11.27 | 1926..... | 98,155 | 11.7 | 11,455 | 12.95 |
| 1917..... | 110,992 | 11.4 | 12,659 | 13.94 | 1927..... | 95,712 | 11.2 | 10,746 | 13.23 |
| 1918..... | 98,439 | 11.7 | 11,476 | 17.97 | 1928..... | 123,327 | 14.5 | 17,896 | 10.50 |
| 1919..... | 91,139 | 9.4 | 8,559 | 22.31 | 1929..... | 106,266 | 10.5 | 11,169 | ----- |

Bureau of Agricultural Economics. Production and stocks are estimates of the crop-reporting board; prices are based upon returns from special price reporters.

¹ Prices 1923-1928 are the mean of Apr. 15 and May 15.

TABLE 313.—*Hay: Receipts at 11 markets, 1908-1928*

| Year beginning July | Balti- more | Bos- ton | Chi- cago | Kan- sas City | Min- neap- olis | New York | Phila- del- phia | St. Louis | San Fran- cisco | Cin- cinnati | Los Ange- les | Oma- ha |
|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> |
| 1908..... | 56, 151 | 129, 450 | 277, 746 | 179, 928 | 31, 880 | 338, 153 | 92, 304 | 208, 025 | 164, 648 | ..... | ..... | ..... |
| 1909..... | 58, 877 | 142, 930 | 256, 260 | 232, 368 | 26, 310 | 334, 760 | 83, 233 | 200, 456 | 168, 220 | ..... | ..... | ..... |
| 1910..... | 68, 273 | 162, 420 | 272, 104 | 308, 940 | 60, 300 | 338, 860 | 81, 529 | 253, 932 | 184, 664 | 166, 566 | ..... | ..... |
| 1911..... | 68, 235 | 163, 220 | 352, 324 | 318, 948 | 63, 570 | 292, 411 | 95, 715 | 259, 642 | 147, 483 | 100, 863 | ..... | ..... |
| 1912..... | 59, 785 | 139, 370 | 276, 187 | 343, 392 | 37, 290 | 309, 322 | 81, 853 | 229, 718 | 141, 224 | 163, 760 | ..... | ..... |
| 1913..... | 61, 823 | 115, 430 | 371, 120 | 285, 288 | 38, 280 | 318, 528 | 75, 614 | 262, 855 | 129, 147 | 230, 456 | ..... | ..... |
| 1914..... | 55, 623 | 116, 020 | 320, 071 | 398, 604 | 45, 513 | 329, 686 | 78, 583 | 299, 550 | 101, 730 | 204, 117 | ..... | ..... |
| 1915..... | 60, 042 | 126, 400 | 280, 224 | 398, 172 | 45, 306 | 296, 200 | 88, 780 | 223, 815 | 145, 373 | 139, 419 | ..... | ..... |
| 1916..... | 50, 794 | 123, 580 | 239, 062 | 359, 316 | 35, 652 | 214, 064 | 79, 006 | 209, 902 | 108, 455 | 233, 585 | ..... | ..... |
| 1917..... | 63, 790 | 95, 170 | 351, 972 | 419, 964 | 39, 126 | 200, 197 | 60, 296 | 238, 144 | 86, 228 | 222, 679 | ..... | ..... |
| 1918..... | 42, 249 | 70, 680 | 287, 217 | 386, 460 | 29, 769 | 217, 300 | 31, 487 | 202, 812 | 80, 233 | 125, 605 | ..... | ..... |
| 1919..... | 32, 059 | 57, 270 | 225, 217 | 617, 052 | 22, 607 | 170, 742 | 49, 868 | 256, 112 | 80, 775 | 112, 130 | ..... | ..... |
| 1920..... | 10, 223 | 82, 200 | 149, 718 | 363, 900 | 23, 118 | 146, 734 | 40, 036 | 179, 633 | 67, 953 | 83, 901 | ..... | ..... |
| 1921..... | 14, 158 | 61, 080 | 142, 753 | 325, 516 | 23, 718 | 102, 381 | 51, 262 | 119, 991 | 59, 185 | 71, 577 | ..... | ..... |
| 1922..... | 16, 081 | 49, 190 | 150, 342 | 261, 084 | 25, 956 | 98, 841 | 42, 246 | 138, 961 | 60, 017 | 64, 893 | ..... | ..... |
| 1923..... | 25, 664 | 42, 910 | 146, 496 | 290, 676 | 30, 432 | 85, 644 | 40, 734 | 138, 540 | 113, 235 | 76, 605 | ..... | ..... |
| 1924..... | 13, 635 | 46, 710 | 155, 158 | 316, 932 | 28, 093 | 64, 332 | 32, 824 | 142, 184 | 50, 159 | 95, 760 | 104, 772 | 62, 520 |
| 1925..... | 15, 839 | 38, 430 | 175, 885 | 341, 892 | 29, 761 | 66, 587 | 33, 190 | 127, 060 | 54, 629 | 43, 752 | 145, 584 | 62, 268 |
| 1926..... | 11, 547 | 30, 680 | 130, 665 | 277, 020 | 38, 187 | 54, 363 | 29, 539 | 85, 844 | 23, 165 | 46, 056 | 95, 406 | 75, 936 |
| 1927..... | 6, 438 | 25, 990 | 104, 241 | 246, 456 | 17, 214 | 42, 921 | 22, 397 | 72, 870 | 38, 157 | 71, 052 | 77, 748 | 64, 900 |
| 1928..... | 2, 435 | 21, 790 | 98, 672 | 248, 124 | 17, 197 | 24, 862 | 18, 706 | 66, 360 | 30, 530 | 79, 152 | 63, 504 | 76, 488 |

Bureau of Agricultural Economics. Compiled as follows: Baltimore, Baltimore Chamber of Commerce annual reports; Boston, Boston Chamber of Commerce annual reports, 1909-1918; Chicago, Board of Trade annual reports; Kansas City, Board of Trade annual reports; Milwaukee, Chamber of Commerce annual reports, except 1923 and 1924; Minneapolis, Chamber of Commerce annual reports; New York, New York Produce Exchange; Peoria, Board of Trade annual reports, 1909-1918; St. Louis, Trade and Commerce of St. Louis, 1909-1923, subsequently Daily Market Reporter; San Francisco, Chamber of Commerce annual reports, 1909-1920; other data from Hay Trade Journal, weekly, and American Elevator and Grain Trade.

¹ Total for 6 months; not reported July-December, 1926.

TABLE 314.—*Hay, tame: Estimated price per ton, received by producers, December 1, average 1923-1927 and annual 1925-1929*

| State | Av., 1923- 1927 | 1925 | 1926 | 1927 | 1928 | 1929 | State | Av., 1923- 1927 | 1925 | 1926 | 1927 | 1928 | 1929 |
|-------------|-----------------------|--------------|--------------|--------------|--------------|--------------|-------------|-----------------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Dols.</i> | <i>Dols.</i> | <i>Dols.</i> | <i>Dols.</i> | <i>Dols.</i> | <i>Dols.</i> | | <i>Dols.</i> | <i>Dols.</i> | <i>Dols.</i> | <i>Dols.</i> | <i>Dols.</i> | <i>Dols.</i> |
| Me..... | 12.88 | 12.00 | 13.20 | 12.70 | 11.40 | 11.00 | N. C..... | 20.20 | 22.00 | 20.00 | 18.00 | 17.30 | 17.80 |
| N. H..... | 18.26 | 18.50 | 19.00 | 16.30 | 14.10 | 13.50 | S. C..... | 19.60 | 20.00 | 20.00 | 18.00 | 18.50 | 19.20 |
| Vt..... | 14.40 | 13.20 | 14.50 | 11.70 | 11.60 | 11.00 | Ga..... | 18.64 | 21.00 | 18.00 | 16.30 | 15.60 | 16.30 |
| Mass..... | 23.58 | 23.00 | 23.90 | 21.00 | 19.10 | 19.20 | Fla..... | 20.64 | 23.00 | 22.00 | 18.20 | 19.00 | 17.50 |
| R. I..... | 24.26 | 23.50 | 25.00 | 22.00 | 22.00 | 22.00 | Ky..... | 16.98 | 18.70 | 16.70 | 14.50 | 16.50 | 15.70 |
| Conn..... | 24.18 | 24.50 | 25.70 | 21.70 | 18.90 | 19.10 | Tenn..... | 18.42 | 22.00 | 16.60 | 15.00 | 16.90 | 17.50 |
| N. Y..... | 14.32 | 14.60 | 15.00 | 11.30 | 11.30 | 12.20 | Ala..... | 18.10 | 20.00 | 18.00 | 15.00 | 15.80 | 16.20 |
| N. J..... | 20.74 | 20.00 | 20.30 | 17.50 | 14.60 | 18.60 | Miss..... | 16.34 | 17.70 | 16.00 | 15.00 | 15.20 | 15.50 |
| Pa..... | 17.30 | 17.00 | 18.50 | 13.50 | 12.50 | 13.10 | Ark..... | 16.08 | 18.00 | 16.00 | 14.00 | 14.40 | 16.00 |
| Ohio..... | 13.58 | 15.20 | 14.00 | 9.20 | 11.70 | 10.00 | La..... | 16.02 | 19.00 | 14.50 | 13.80 | 14.40 | 13.60 |
| Ind..... | 13.60 | 15.50 | 14.00 | 10.40 | 12.00 | 10.10 | Okla..... | 13.26 | 16.00 | 12.00 | 10.70 | 12.70 | 13.70 |
| Ill..... | 14.32 | 15.90 | 16.00 | 11.40 | 12.90 | 11.30 | Tex..... | 15.08 | 18.80 | 12.00 | 11.80 | 13.20 | 13.30 |
| Mich..... | 13.58 | 16.50 | 13.80 | 11.00 | 11.60 | 10.70 | Mont..... | 9.56 | 10.00 | 10.50 | 8.40 | 8.90 | 12.40 |
| Wis..... | 14.16 | 14.00 | 15.00 | 12.50 | 14.40 | 10.50 | Idaho..... | 9.46 | 8.50 | 9.00 | 8.70 | 11.00 | 10.80 |
| Minn..... | 11.40 | 11.00 | 14.20 | 9.00 | 9.70 | 10.60 | Wyo..... | 9.16 | 8.90 | 8.50 | 9.00 | 10.10 | 12.20 |
| Iowa..... | 13.08 | 13.50 | 15.50 | 12.50 | 13.00 | 11.00 | Colo..... | 10.42 | 12.00 | 8.60 | 9.20 | 11.70 | 11.50 |
| Mo..... | 12.04 | 12.80 | 13.50 | 9.90 | 10.60 | 10.40 | N. Mex..... | 14.36 | 15.00 | 12.00 | 13.40 | 16.90 | 18.10 |
| N. Dak..... | 8.08 | 7.20 | 11.00 | 7.80 | 6.70 | 8.50 | Ariz..... | 15.14 | 17.00 | 13.00 | 14.40 | 18.00 | 18.00 |
| S. Dak..... | 9.72 | 11.00 | 13.00 | 7.60 | 8.20 | 8.70 | Utah..... | 9.42 | 9.00 | 8.00 | 9.20 | 11.70 | 10.40 |
| Nebr..... | 10.88 | 12.10 | 14.00 | 8.50 | 10.00 | 10.50 | Nev..... | 10.94 | 9.00 | 10.50 | 10.00 | 12.20 | 15.60 |
| Kans..... | 11.10 | 12.10 | 13.00 | 8.60 | 9.40 | 11.80 | Wash..... | 13.82 | 15.00 | 13.70 | 12.90 | 13.10 | 16.80 |
| Del..... | 18.00 | 20.00 | 18.50 | 16.50 | 16.40 | 17.50 | Oreg..... | 11.62 | 11.60 | 11.00 | 11.20 | 11.70 | 14.40 |
| Md..... | 18.88 | 19.00 | 20.00 | 15.40 | 13.50 | 13.70 | Calif..... | 14.90 | 14.00 | 12.30 | 12.50 | 14.50 | 16.60 |
| Va..... | 18.86 | 21.00 | 19.50 | 16.00 | 15.30 | 15.50 | | | | | | | |
| W. Va..... | 18.38 | 20.00 | 19.40 | 15.00 | 14.70 | 15.10 | U. S..... | 13.45 | 13.93 | 14.10 | 11.35 | 12.27 | 12.23 |

Bureau of Agricultural Economics. As reported by crop reporters.

TABLE 315.—*Hay, all (loose): Estimated average price per ton, received by producers, United States, 1909-1929*

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weighted average |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1909..... | 10.12 | 9.70 | 9.85 | 10.19 | 10.42 | 10.48 | 10.90 | 11.48 | 11.57 | 11.30 | 10.96 | 10.80 | 10.58 |
| 1910..... | 10.75 | 10.98 | 11.16 | 11.16 | 11.67 | 11.92 | 11.74 | 11.68 | 11.46 | 11.52 | 12.04 | 12.78 | 11.54 |
| 1911..... | 13.51 | 13.73 | 13.58 | 13.57 | 13.95 | 14.02 | 14.07 | 14.52 | 15.15 | 15.98 | 16.26 | 15.27 | 14.36 |
| 1912..... | 13.18 | 11.62 | 11.12 | 11.05 | 11.44 | 11.45 | 10.98 | 10.74 | 10.52 | 10.42 | 10.48 | 10.51 | 11.17 |
| 1913..... | 10.45 | 10.74 | 11.24 | 11.48 | 11.97 | 12.06 | 11.68 | 11.68 | 11.60 | 11.58 | 11.64 | 11.46 | 11.49 |
| 1914..... | 11.02 | 10.93 | 11.03 | 10.87 | 10.95 | 10.80 | 10.65 | 10.86 | 10.94 | 11.00 | 11.10 | 11.00 | 10.92 |
| 1915..... | 10.52 | 10.07 | 9.89 | 9.90 | 9.92 | 9.97 | 10.31 | 10.65 | 10.80 | 11.06 | 11.37 | 11.28 | 10.34 |
| 1916..... | 10.50 | 9.80 | 9.68 | 9.82 | 10.31 | 10.74 | 11.10 | 11.44 | 12.04 | 13.24 | 14.31 | 14.32 | 11.21 |
| 1917..... | 13.43 | 13.08 | 13.54 | 14.50 | 15.85 | 17.32 | 18.48 | 19.01 | 18.91 | 18.32 | 17.55 | 16.60 | 16.60 |
| 1918..... | 16.00 | 16.67 | 17.94 | 18.86 | 19.31 | 19.64 | 19.86 | 19.80 | 20.17 | 21.42 | 22.80 | 22.52 | 19.88 |
| 1919..... | 20.94 | 20.34 | 20.16 | 19.58 | 19.40 | 20.00 | 21.16 | 22.04 | 22.62 | 23.58 | 24.54 | 24.24 | 21.34 |
| 1920..... | 22.26 | 20.38 | 19.41 | 18.20 | 17.08 | 16.43 | 15.70 | 14.70 | 13.94 | 13.34 | 12.80 | 12.56 | 16.51 |
| 1921..... | 12.17 | 11.72 | 11.53 | 11.24 | 11.19 | 11.29 | 11.34 | 11.58 | 12.05 | 12.64 | 12.82 | 12.28 | 11.83 |
| 1922..... | 11.44 | 10.78 | 10.68 | 10.87 | 11.38 | 11.82 | 11.98 | 12.04 | 12.18 | 12.54 | 12.82 | 12.32 | 11.08 |
| 1923..... | 11.78 | 11.98 | 12.25 | 12.44 | 12.75 | 13.15 | 13.59 | 13.60 | 13.63 | 13.73 | 13.65 | 13.75 | 12.93 |
| 1924..... | 13.49 | 12.95 | 12.68 | 12.64 | 12.88 | 12.69 | 12.70 | 12.83 | 12.59 | 12.48 | 12.17 | 11.82 | 12.76 |
| 1925..... | 12.48 | 12.25 | 12.42 | 12.47 | 13.07 | 13.40 | 13.31 | 13.63 | 12.97 | 12.78 | 13.12 | 12.98 | 12.85 |
| 1926..... | 12.96 | 13.04 | 12.88 | 13.08 | 13.22 | 13.47 | 13.38 | 13.64 | 13.48 | 13.26 | 13.20 | 13.10 | 13.25 |
| 1927..... | 11.71 | 9.97 | 10.51 | 10.63 | 10.54 | 10.55 | 10.60 | 10.24 | 10.19 | 10.29 | 10.70 | 11.01 | 10.57 |
| 1928..... | 10.86 | 10.39 | 10.59 | 10.60 | 10.89 | 11.23 | 11.61 | 12.06 | 12.37 | 12.30 | 12.15 | 11.88 | 11.29 |
| 1929..... | 11.17 | 10.85 | 11.05 | 11.07 | 11.18 | 11.04 | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of all loose hay for each State; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1909-December, 1923.

TABLE 316.—*Hay, alfalfa: Estimated average price per ton received by producers, United States, 1914-1929*

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weighted average |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1914..... | 8.65 | 8.38 | 8.72 | 8.96 | 9.20 | 9.05 | 9.48 | 9.32 | 9.79 | 9.81 | 9.58 | 8.50 | 9.12 |
| 1915..... | 8.28 | 8.28 | 8.22 | 8.14 | 8.72 | 9.52 | 9.89 | 10.35 | 10.74 | 10.73 | 10.56 | 10.49 | 9.39 |
| 1916..... | 9.87 | 9.80 | 10.06 | 10.25 | 11.37 | 12.31 | 12.79 | 13.63 | 14.68 | 17.68 | 17.92 | 16.77 | 12.76 |
| 1917..... | 14.13 | 15.28 | 16.33 | 17.59 | 19.19 | 20.39 | 21.27 | 21.38 | 20.82 | 18.97 | 17.84 | 16.74 | 18.42 |
| 1918..... | 16.58 | 18.22 | 19.72 | 20.23 | 20.42 | 20.74 | 20.42 | 20.91 | 21.40 | 22.28 | 23.32 | 20.89 | 20.35 |
| 1919..... | 20.15 | 20.72 | 20.89 | 20.56 | 21.63 | 22.95 | 24.13 | 24.41 | 24.68 | 24.57 | 25.68 | 24.20 | 22.70 |
| 1920..... | 21.70 | 20.43 | 19.12 | 18.03 | 17.10 | 16.59 | 14.98 | 13.55 | 12.88 | 11.35 | 10.88 | 10.64 | 15.96 |
| 1921..... | 9.85 | 9.66 | 9.86 | 9.82 | 9.67 | 10.46 | 10.55 | 11.04 | 11.80 | 12.39 | 12.28 | 10.98 | 10.58 |
| 1922..... | 10.61 | 10.54 | 11.15 | 11.87 | 12.70 | 13.31 | 14.06 | 14.02 | 14.33 | 14.09 | 14.40 | 13.63 | 12.82 |
| 1923..... | 12.45 | 12.01 | 12.78 | 13.37 | 13.59 | 14.39 | 13.99 | 14.08 | 13.98 | 14.09 | 14.12 | 13.70 | 13.54 |
| 1924..... | 13.19 | 13.84 | 13.59 | 12.85 | 13.91 | 13.40 | 14.50 | 14.78 | 14.44 | 14.08 | 14.34 | 12.82 | 13.81 |
| 1925..... | 13.02 | 13.00 | 12.91 | 13.41 | 13.74 | 14.14 | 13.90 | 14.14 | 13.50 | 13.53 | 13.17 | 13.33 | 13.52 |
| 1926..... | 12.94 | 13.15 | 13.13 | 13.29 | 13.79 | 13.57 | 13.83 | 14.21 | 14.38 | 13.85 | 13.59 | 13.09 | 13.57 |
| 1927..... | 11.73 | 11.47 | 11.34 | 11.52 | 11.75 | 12.02 | 12.09 | 11.84 | 12.46 | 12.56 | 12.90 | 12.42 | 11.96 |
| 1928..... | 11.98 | 11.82 | 12.20 | 12.82 | 13.29 | 13.90 | 14.54 | 15.34 | 16.07 | 16.20 | 15.50 | 14.50 | 13.90 |
| 1929..... | 13.12 | 13.17 | 13.50 | 13.84 | 14.00 | 14.41 | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of alfalfa hay for each State; yearly price obtained by weighting monthly prices by average monthly marketings.

TABLE 317.—*Hay, clover: Estimated average price per ton received by producers, United States, 1914-1929*

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weighted average |
|---------------------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1914 | 11.85 | 12.09 | 12.44 | 12.47 | 12.70 | 12.76 | 13.07 | 13.36 | 13.41 | 13.65 | 13.79 | 12.78 | 12.83 |
| 1915 | 11.65 | 10.87 | 10.82 | 10.60 | 10.59 | 10.95 | 11.24 | 11.41 | 14.70 | 11.87 | 12.52 | 12.46 | 11.29 |
| 1916 | 10.84 | 9.93 | 10.01 | 10.08 | 10.46 | 10.86 | 11.38 | 11.65 | 11.90 | 13.06 | 13.94 | 14.22 | 11.33 |
| 1917 | 12.95 | 12.76 | 13.70 | 15.01 | 17.14 | 18.67 | 19.82 | 21.11 | 21.37 | 19.68 | 18.30 | 16.54 | 17.21 |
| 1918 | 15.73 | 17.18 | 19.27 | 20.60 | 21.13 | 21.26 | 21.69 | 21.11 | 21.25 | 23.36 | 25.33 | 25.48 | 20.93 |
| 1919 | 22.02 | 21.58 | 21.74 | 21.17 | 21.61 | 22.60 | 23.78 | 24.94 | 26.13 | 26.93 | 28.31 | 27.80 | 23.09 |
| 1920 | 24.62 | 22.82 | 22.57 | 21.29 | 20.60 | 19.98 | 19.17 | 17.39 | 16.44 | 15.47 | 14.90 | 14.52 | 19.48 |
| 1921 | 13.89 | 14.17 | 14.37 | 13.99 | 13.83 | 14.17 | 13.90 | 14.10 | 14.06 | 14.51 | 14.90 | 14.33 | 14.05 |
| 1922 | 12.82 | 12.66 | 12.54 | 12.51 | 12.67 | 13.03 | 13.39 | 13.35 | 13.24 | 13.47 | 13.58 | 13.70 | 13.15 |
| 1923 | 13.52 | 13.51 | 14.12 | 14.73 | 14.94 | 15.82 | 15.51 | 15.93 | 16.31 | 16.08 | 15.92 | 15.95 | 15.14 |
| 1924 | 15.46 | 14.00 | 13.75 | 13.65 | 13.64 | 13.45 | 13.25 | 13.30 | 12.52 | 12.41 | 12.67 | 12.26 | 14.35 |
| 1925 | 13.03 | 13.67 | 14.06 | 14.09 | 14.74 | 15.28 | 14.79 | 14.82 | 14.79 | 14.88 | 15.13 | 15.07 | 14.52 |
| 1926 | 14.40 | 14.25 | 14.60 | 14.71 | 14.76 | 15.24 | 15.71 | 16.16 | 15.64 | 15.51 | 15.21 | 14.65 | 15.06 |
| 1927 | 13.11 | 12.16 | 11.78 | 11.91 | 11.86 | 11.91 | 12.24 | 11.96 | 12.02 | 12.23 | 12.51 | 12.63 | 12.15 |
| 1928 | 12.52 | 12.25 | 12.50 | 12.58 | 13.01 | 13.05 | 13.41 | 13.59 | 13.93 | 13.43 | 13.24 | 12.92 | 13.02 |
| 1929 | 11.60 | 11.61 | 11.82 | 11.77 | 11.82 | 11.97 | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of clover hay for each State; yearly prices obtained by weighting monthly prices by average monthly marketings.

TABLE 318.—*Hay, timothy: Estimated average price per ton received by producers, United States, 1914-1929*

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weighted average |
|---------------------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1914 | 13.06 | 13.09 | 13.54 | 14.66 | 13.69 | 13.69 | 14.07 | 14.28 | 14.28 | 14.53 | 14.74 | 14.33 | 13.87 |
| 1915 | 13.43 | 12.39 | 12.32 | 12.14 | 12.24 | 12.73 | 13.11 | 13.39 | 13.61 | 14.00 | 14.50 | 14.71 | 13.09 |
| 1916 | 12.97 | 11.74 | 11.57 | 11.54 | 12.03 | 12.29 | 12.61 | 12.91 | 13.20 | 14.26 | 15.31 | 15.76 | 12.83 |
| 1917 | 14.68 | 14.11 | 14.89 | 16.23 | 18.33 | 20.31 | 21.37 | 22.25 | 22.53 | 21.47 | 20.40 | 18.55 | 18.67 |
| 1918 | 17.61 | 18.98 | 20.85 | 22.60 | 22.93 | 22.94 | 23.48 | 22.69 | 22.68 | 24.74 | 27.27 | 27.50 | 22.66 |
| 1919 | 24.22 | 23.89 | 23.65 | 23.04 | 22.90 | 23.71 | 24.59 | 25.49 | 26.75 | 27.99 | 29.92 | 30.05 | 25.13 |
| 1920 | 26.59 | 24.35 | 24.15 | 22.74 | 22.09 | 21.22 | 19.88 | 18.30 | 17.04 | 16.09 | 15.44 | 15.16 | 20.64 |
| 1921 | 14.51 | 15.01 | 14.88 | 14.39 | 14.22 | 14.31 | 14.51 | 14.77 | 15.06 | 15.52 | 16.10 | 15.75 | 14.82 |
| 1922 | 14.33 | 13.61 | 13.44 | 13.70 | 13.93 | 13.91 | 14.41 | 14.46 | 14.59 | 14.64 | 14.96 | 14.95 | 14.18 |
| 1923 | 14.80 | 14.68 | 15.13 | 16.22 | 16.78 | 16.95 | 16.96 | 17.25 | 17.53 | 17.53 | 17.48 | 17.52 | 16.53 |
| 1924 | 16.74 | 15.24 | 14.47 | 14.54 | 14.00 | 14.37 | 14.29 | 14.24 | 13.31 | 13.39 | 13.38 | 13.05 | 14.30 |
| 1925 | 13.89 | 14.06 | 14.98 | 15.41 | 15.38 | 15.87 | 15.82 | 15.79 | 15.59 | 15.81 | 16.31 | 16.64 | 15.40 |
| 1926 | 16.01 | 15.52 | 15.32 | 15.49 | 15.62 | 15.81 | 14.58 | 15.82 | 15.39 | 15.06 | 15.14 | 14.97 | 15.42 |
| 1927 | 13.29 | 12.03 | 11.70 | 11.58 | 11.67 | 11.31 | 11.34 | 11.03 | 11.14 | 11.17 | 11.75 | 11.82 | 11.64 |
| 1928 | 11.68 | 11.70 | 11.77 | 11.86 | 12.18 | 12.35 | 12.45 | 12.99 | 13.01 | 12.86 | 12.64 | 12.57 | 12.31 |
| 1929 | 11.91 | 11.61 | 11.60 | 11.67 | 11.70 | 11.57 | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of timothy hay for each State; yearly prices obtained by weighting monthly prices by average monthly marketings.

TABLE 319.—*Hay, prairie: Estimated average price per ton, received by producers, United States, 1914-1929*

| Year beginning July | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weighted average |
|---------------------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1914 | 7.49 | 7.29 | 7.33 | 7.59 | 7.49 | 7.37 | 7.65 | 7.86 | 8.03 | 8.58 | 8.29 | 7.72 | 7.69 |
| 1915 | 7.37 | 6.83 | 6.64 | 6.44 | 6.75 | 6.95 | 7.38 | 7.34 | 7.39 | 7.56 | 7.71 | 7.97 | 7.13 |
| 1916 | 7.25 | 6.96 | 7.21 | 7.26 | 7.85 | 8.14 | 8.58 | 8.60 | 9.32 | 10.94 | 12.02 | 11.84 | 8.61 |
| 1917 | 10.11 | 10.82 | 11.40 | 12.29 | 13.32 | 14.91 | 15.39 | 15.74 | 15.47 | 14.47 | 12.75 | 12.78 | 13.31 |
| 1918 | 12.51 | 13.26 | 14.35 | 15.06 | 15.47 | 16.30 | 16.33 | 16.35 | 17.38 | 18.85 | 20.22 | 18.71 | 16.03 |
| 1919 | 16.10 | 16.10 | 15.99 | 15.86 | 16.91 | 17.19 | 17.64 | 17.39 | 16.82 | 16.66 | 16.08 | 17.59 | 16.78 |
| 1920 | 15.38 | 13.74 | 12.93 | 11.83 | 11.47 | 10.80 | 10.20 | 9.46 | 8.70 | 8.43 | 8.05 | 8.02 | 10.94 |
| 1921 | 7.67 | 7.50 | 7.52 | 6.78 | 7.49 | 7.47 | 7.39 | 7.67 | 7.94 | 8.62 | 8.24 | 8.40 | 7.62 |
| 1922 | 7.68 | 7.76 | 7.64 | 7.74 | 8.13 | 8.08 | 9.44 | 9.52 | 9.61 | 9.74 | 10.64 | 10.07 | 8.79 |
| 1923 | 9.17 | 8.97 | 8.58 | 9.19 | 9.07 | 9.26 | 8.84 | 8.87 | 8.66 | 8.78 | 8.74 | 8.54 | 8.92 |
| 1924 | 8.35 | 8.60 | 8.49 | 8.25 | 8.25 | 8.62 | 9.14 | 9.08 | 9.05 | 9.11 | 9.27 | 8.55 | 8.70 |
| 1925 | 8.93 | 8.55 | 9.24 | 9.41 | 9.39 | 9.78 | 9.73 | 9.53 | 9.48 | 9.06 | 9.54 | 9.59 | 9.36 |
| 1926 | 9.63 | 10.55 | 10.52 | 10.78 | 10.76 | 10.98 | 11.28 | 11.76 | 11.50 | 10.70 | 11.51 | 10.77 | 10.87 |
| 1927 | 9.15 | 8.65 | 7.98 | 7.67 | 7.47 | 7.55 | 7.41 | 6.98 | 6.79 | 6.96 | 7.32 | 7.50 | 7.64 |
| 1928 | 7.60 | 7.34 | 7.62 | 7.71 | 7.72 | 7.88 | 8.01 | 8.33 | 8.99 | 8.83 | 8.85 | 9.03 | 8.10 |
| 1929 | 8.54 | 8.24 | 8.39 | 8.21 | 8.44 | 8.31 | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of prairie hay for each State; yearly prices obtained by weighting monthly prices by average monthly marketings.

TABLE 320.—*Hay: Average price per ton at leading markets, by kind and grade, 1920-1928*

| Year beginning July | Alfalfa, Kansas City | | Clover, Cincinnati | | | Prairie upland, Kansas City | | Timothy, Chicago | |
|---------------------|----------------------|---------|--------------------|--------------------|--------------|-----------------------------|---------|------------------|---------|
| | No. 1 | No. 2 | No. 1 | No. 1, light mixed | No. 1, mixed | No. 1 | No. 2 | No. 1 | No. 2 |
| | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 1920..... | 23.90 | 17.60 | 23.90 | 25.50 | 24.30 | 15.50 | 13.20 | 22.30 | 18.50 |
| 1921..... | 19.75 | 13.90 | 19.80 | 19.00 | 17.80 | 11.70 | 10.00 | 22.30 | 18.50 |
| 1922..... | 22.10 | 16.80 | 18.40 | 17.40 | 16.40 | 14.40 | 12.90 | 22.30 | 18.50 |
| 1923..... | 23.60 | 16.90 | 23.90 | 23.40 | 22.60 | 13.90 | 12.60 | 22.30 | 18.50 |
| 1924..... | 20.10 | 15.00 | 17.90 | 18.00 | 17.20 | 11.20 | 9.80 | 22.30 | 18.50 |
| 1925..... | 21.10 | 17.40 | 22.50 | 23.60 | 22.00 | 14.20 | 12.80 | 24.70 | 21.90 |
| 1926..... | 19.00 | 16.00 | 22.50 | 21.20 | 21.70 | 14.50 | 12.70 | 21.80 | 19.70 |
| 1927..... | 20.80 | 16.00 | 22.50 | 15.70 | 16.40 | 10.90 | 8.90 | 18.60 | 16.40 |
| 1928..... | 24.80 | 22.70 | 24.10 | 19.20 | 20.90 | 12.10 | 10.50 | 22.20 | 20.20 |

Bureau of Agricultural Economics. Compiled from reports made direct to the bureau.

TABLE 321.—*Alfalfa meal, No. 1 medium: Average price per ton, bagged, in car lots, Kansas City, 1919-1929*

| Year beginning July | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Average |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1919..... | 38.25 | 35.50 | 34.60 | 29.70 | 29.90 | 25.40 | 40.70 | 40.00 | 38.10 | 40.40 | 46.75 | 42.75 | 38.25 |
| 1920..... | 19.00 | 18.75 | 17.75 | 16.90 | 16.50 | 16.70 | 16.75 | 17.50 | 19.75 | 19.40 | 20.90 | 21.90 | 18.50 |
| 1921..... | 18.60 | 19.50 | 21.20 | 24.00 | 26.25 | 26.20 | 25.40 | 25.40 | 24.40 | 26.50 | 23.10 | 23.40 | 24.00 |
| 1922..... | 21.50 | 22.40 | 25.50 | 25.70 | 26.90 | 25.20 | 26.25 | 23.90 | 23.20 | 20.50 | 21.20 | 21.75 | 23.70 |
| 1923..... | 22.00 | 22.60 | 23.25 | 23.10 | 22.50 | 23.90 | 24.20 | 22.50 | 22.00 | 22.20 | 22.70 | 22.90 | 22.80 |
| 1924..... | 23.00 | 24.00 | 24.25 | 24.40 | 24.10 | 24.40 | 24.80 | 24.00 | 23.10 | 23.90 | 25.40 | 23.90 | 24.10 |
| 1925..... | 23.00 | 22.80 | 22.25 | 22.40 | 22.90 | 22.30 | 22.00 | 21.75 | 21.40 | 21.00 | 22.20 | 21.60 | 22.10 |
| 1926..... | 21.75 | 22.40 | 23.40 | 23.10 | 22.75 | 23.30 | 24.40 | 26.25 | 29.40 | 33.50 | 34.25 | 31.70 | 28.40 |
| 1927..... | 27.60 | 25.00 | 26.00 | 26.60 | 26.60 | 28.60 | 29.75 | 29.90 | 28.50 | 28.00 | 27.00 | 25.10 | 27.40 |
| 1928..... | 23.50 | 25.00 | 27.30 | 27.50 | 26.80 | 27.40 | | | | | | | |
| 1929..... | 23.50 | 25.00 | 27.30 | 27.50 | 26.80 | 27.40 | | | | | | | |

Bureau of Agricultural Economics. Compiled from reports made to the bureau.

TABLE 322.—*Pasture: ¹ Condition, 1st of month, United States, 1909-1929*

| Year | May | June | July | Aug. | Sept. | Oct. | Year | May | June | July | Aug. | Sept. | Oct. |
|-----------|-------|-------|-------|-------|-------|-------|-----------|-------|-------|-------|-------|-------|-------|
| | P. d. | P. d. | P. d. | P. d. | P. d. | P. d. | | P. d. | P. d. | P. d. | P. d. | P. d. | P. d. |
| 1909..... | 79.1 | 86.9 | 91.8 | 86.4 | ----- | ----- | 1920..... | 79.3 | 90.2 | 91.4 | 87.7 | 88.1 | 86.9 |
| 1910..... | 86.9 | 87.1 | 79.7 | 71.5 | ----- | ----- | 1921..... | 90.0 | 89.4 | 84.4 | 78.3 | 82.1 | 84.8 |
| 1911..... | 83.1 | 82.7 | 67.2 | 62.7 | ----- | ----- | 1922..... | 85.9 | 94.6 | 88.5 | 86.7 | 78.7 | 72.7 |
| 1912..... | 82.9 | 92.5 | 80.7 | 87.3 | ----- | ----- | 1923..... | 79.4 | 86.1 | 87.2 | 79.4 | 80.2 | 85.0 |
| 1913..... | 85.5 | 88.1 | 81.6 | 74.3 | ----- | ----- | 1924..... | 82.4 | 83.2 | 87.2 | 82.0 | 76.6 | 78.6 |
| 1914..... | 88.9 | 90.0 | 83.0 | 76.2 | ----- | ----- | 1925..... | 82.2 | 75.7 | 78.0 | 69.5 | 67.4 | 72.9 |
| 1915..... | 88.4 | 92.5 | 93.2 | 95.5 | 97.7 | 95.9 | 1926..... | 74.6 | 77.0 | 77.0 | 69.9 | 78.2 | 83.7 |
| 1916..... | 84.8 | 90.8 | 84.8 | 84.6 | 79.8 | 76.9 | 1927..... | 87.0 | 88.3 | 92.8 | 86.9 | 84.2 | 80.1 |
| 1917..... | 79.9 | 83.1 | 84.1 | 78.5 | 77.5 | 75.5 | 1928..... | 71.3 | 86.4 | 84.4 | 85.6 | 83.3 | 77.7 |
| 1918..... | 81.6 | 89.3 | 82.0 | 72.4 | 67.7 | 73.5 | 1929..... | 86.9 | 87.2 | 87.5 | 79.7 | 67.1 | 70.2 |
| 1919..... | 91.1 | 97.4 | 95.8 | 85.3 | 81.6 | 78.9 | | | | | | | |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ For range States, condition given as reported. Probably relates largely to farm pasture, i. e., range not included.

STATISTICS OF MISCELLANEOUS CROPS

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TABLE 323.—*Pasture: 1 Condition, 1st of month, by States, average 1919-1928, and 1929*

| State and division | May | | June | | July | | August | | September | | October | |
|---------------------|--------------------|--------|--------------------|--------|--------------------|--------|--------------------|--------|--------------------|--------|--------------------|--------|
| | Average, 1919-1928 | 1929 | Average, 1919-1928 | 1929 | Average, 1919-1928 | 1929 | Average, 1919-1928 | 1929 | Average, 1919-1928 | 1929 | Average, 1919-1928 | 1929 |
| | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. |
| Maine..... | 86 | 86 | 88 | 88 | 87 | 91 | 87 | 76 | 83 | 66 | 80 | 64 |
| New Hampshire..... | 86 | 88 | 90 | 93 | 88 | 94 | 90 | 71 | 86 | 69 | 84 | 67 |
| Vermont..... | 86 | 90 | 89 | 93 | 91 | 99 | 93 | 92 | 89 | 78 | 88 | 74 |
| Massachusetts..... | 84 | 88 | 90 | 90 | 87 | 81 | 87 | 57 | 88 | 46 | 86 | 57 |
| Rhode Island..... | 84 | 88 | 89 | 92 | 88 | 82 | 88 | 62 | 86 | 58 | 84 | 64 |
| Connecticut..... | 82 | 92 | 88 | 95 | 88 | 79 | 86 | 53 | 86 | 50 | 86 | 56 |
| New York..... | 81 | 87 | 86 | 89 | 86 | 87 | 84 | 75 | 83 | 60 | 83 | 56 |
| New Jersey..... | 81 | 90 | 85 | 90 | 79 | 82 | 81 | 50 | 88 | 46 | 83 | 67 |
| Pennsylvania..... | 80 | 89 | 86 | 90 | 84 | 86 | 83 | 71 | 85 | 56 | 83 | 58 |
| North Atlantic..... | 81.8 | 88.1 | 86.3 | 89.9 | 85.7 | 86.8 | 84.4 | 71.6 | 84.7 | 58.4 | 83.4 | 58.9 |
| Ohio..... | 79 | 90 | 85 | 92 | 85 | 92 | 83 | 89 | 84 | 80 | 82 | 80 |
| Indiana..... | 80 | 88 | 86 | 80 | 85 | 92 | 77 | 85 | 80 | 71 | 79 | 74 |
| Illinois..... | 83 | 88 | 85 | 88 | 84 | 92 | 76 | 87 | 79 | 77 | 80 | 69 |
| Michigan..... | 72 | 81 | 84 | 84 | 82 | 90 | 74 | 74 | 74 | 49 | 81 | 45 |
| Wisconsin..... | 78 | 91 | 85 | 87 | 86 | 94 | 78 | 87 | 75 | 68 | 80 | 67 |
| Minnesota..... | 78 | 86 | 83 | 78 | 85 | 77 | 79 | 67 | 74 | 55 | 77 | 64 |
| Iowa..... | 85 | 93 | 85 | 91 | 88 | 96 | 81 | 93 | 84 | 78 | 88 | 83 |
| Missouri..... | 84 | 91 | 86 | 90 | 88 | 94 | 81 | 84 | 82 | 70 | 83 | 70 |
| North Dakota..... | 76 | 78 | 81 | 72 | 86 | 71 | 81 | 50 | 74 | 37 | 74 | 45 |
| South Dakota..... | 79 | 86 | 81 | 83 | 77 | 79 | 70 | 76 | 76 | 54 | 75 | 66 |
| Nebraska..... | 84 | 91 | 88 | 90 | 89 | 92 | 82 | 83 | 79 | 65 | 79 | 77 |
| Kansas..... | 84 | 88 | 87 | 90 | 88 | 91 | 83 | 88 | 79 | 70 | 82 | 76 |
| North Central..... | 81.0 | 88.7 | 85.2 | 87.7 | 86.2 | 90.2 | 80.0 | 83.1 | 79.5 | 68.1 | 81.2 | 71.3 |
| Delaware..... | 81 | 91 | 84 | 91 | 74 | 78 | 77 | 55 | 83 | 42 | 78 | 54 |
| Maryland..... | 78 | 91 | 82 | 88 | 77 | 84 | 76 | 65 | 83 | 50 | 80 | 65 |
| Virginia..... | 80 | 93 | 84 | 93 | 81 | 95 | 82 | 90 | 85 | 77 | 79 | 71 |
| West Virginia..... | 81 | 91 | 85 | 92 | 88 | 87 | 89 | 79 | 90 | 74 | 87 | 69 |
| North Carolina..... | 83 | 89 | 84 | 90 | 85 | 92 | 84 | 91 | 83 | 88 | 77 | 87 |
| South Carolina..... | 81 | 86 | 78 | 87 | 79 | 84 | 80 | 82 | 76 | 71 | 70 | 76 |
| Georgia..... | 82 | 88 | 83 | 87 | 82 | 87 | 84 | 82 | 79 | 70 | 72 | 73 |
| Florida..... | 81 | 81 | 82 | 84 | 88 | 89 | 91 | 90 | 90 | 68 | 87 | 90 |
| South Atlantic..... | 80.9 | 90.0 | 83.5 | 90.1 | 82.9 | 89.4 | 83.6 | 83.4 | 84.4 | 74.0 | 78.9 | 73.5 |
| Kentucky..... | 83 | 90 | 87 | 91 | 88 | 91 | 83 | 83 | 84 | 69 | 80 | 80 |
| Tennessee..... | 83 | 91 | 87 | 93 | 86 | 91 | 79 | 87 | 82 | 73 | 77 | 80 |
| Alabama..... | 83 | 87 | 85 | 87 | 83 | 84 | 81 | 82 | 79 | 66 | 71 | 70 |
| Mississippi..... | 85 | 87 | 86 | 86 | 86 | 83 | 81 | 83 | 80 | 75 | 74 | 75 |
| Arkansas..... | 83 | 88 | 88 | 91 | 86 | 85 | 81 | 72 | 78 | 50 | 78 | 52 |
| Louisiana..... | 85 | 86 | 87 | 86 | 89 | 82 | 84 | 80 | 82 | 74 | 79 | 73 |
| Oklahoma..... | 84 | 86 | 88 | 89 | 88 | 88 | 80 | 78 | 74 | 57 | 76 | 65 |
| Texas..... | 84 | 88 | 88 | 89 | 88 | 86 | 80 | 77 | 74 | 59 | 78 | 65 |
| South Central..... | 84.0 | 88.0 | 87.4 | 89.3 | 87.5 | 86.8 | 80.6 | 79.3 | 77.0 | 62.6 | 77.0 | 68.7 |
| Montana..... | 81 | 80 | 87 | 80 | 86 | 86 | 81 | 62 | 78 | 53 | 76 | 62 |
| Idaho..... | 87 | 82 | 92 | 85 | 87 | 87 | 82 | 78 | 79 | 76 | 79 | 73 |
| Wyoming..... | 89 | 80 | 95 | 89 | 94 | 93 | 89 | 86 | 88 | 79 | 87 | 86 |
| Colorado..... | 86 | 84 | 90 | 88 | 90 | 75 | 85 | 73 | 86 | 83 | 82 | 86 |
| New Mexico..... | 75 | 80 | 84 | 88 | 81 | 83 | 78 | 78 | 83 | 87 | 80 | 89 |
| Arizona..... | 84 | 85 | 84 | 75 | 81 | 67 | 82 | 75 | 86 | 90 | 84 | 95 |
| Utah..... | 87 | 80 | 92 | 82 | 88 | 77 | 83 | 77 | 81 | 86 | 80 | 93 |
| Nevada..... | 88 | 73 | 93 | 75 | 90 | 78 | 87 | 77 | 84 | 71 | 84 | 71 |
| Washington..... | 87 | 70 | 90 | 79 | 85 | 85 | 74 | 75 | 70 | 65 | 75 | 58 |
| Oregon..... | 92 | 77 | 94 | 86 | 90 | 93 | 84 | 80 | 77 | 71 | 80 | 65 |
| California..... | 87 | 71 | 85 | 69 | 83 | 69 | 81 | 68 | 79 | 68 | 77 | 68 |
| Far Western..... | 85.2 | 77.4 | 88.3 | 79.9 | 86.3 | 79.5 | 82.2 | 72.5 | 80.7 | 72.0 | 79.5 | 74.1 |
| United States..... | 82.3 | 86.9 | 86.0 | 87.2 | 86.2 | 87.5 | 81.1 | 79.7 | 80.0 | 67.1 | 80.1 | 70.2 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ For range States, condition given as reported. Probably relates largely to farm pasture, i. e., range not included.

TABLE 324.—*Hops: Acreage, production, December 1 price, imports, exports, and consumption in the United States, 1915-1929*

| Year beginning July | Acreage | Average yield per acre | Production | Price per pound received by producers Dec. 1 | Imports ¹ | Domestic exports ¹ | Net exports ¹ | Consumption by brewers ² |
|-------------------------|--------------|------------------------|---------------------|--|----------------------|-------------------------------|--------------------------|-------------------------------------|
| | <i>Acres</i> | <i>Pounds</i> | <i>1,000 pounds</i> | <i>Cents</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| 1915..... | 44,653 | 1,187 | 52,980 | 11.7 | 076 | 22,410 | 21,869 | 37,452 |
| 1916..... | 43,900 | 1,153 | 50,595 | 12.0 | 237 | 4,875 | 4,664 | 41,049 |
| 1917..... | 29,900 | 983 | 29,388 | 33.3 | 121 | 3,495 | 3,411 | 33,481 |
| 1918..... | 25,900 | 820 | 21,481 | 19.3 | (³) | 7,467 | 7,472 | 13,925 |
| 1919..... | 21,000 | 1,189 | 24,970 | 77.6 | 2,696 | 30,780 | 28,187 | 6,441 |
| 1920..... | 28,000 | 1,224 | 34,280 | 35.7 | 4,808 | 22,206 | 18,226 | 5,989 |
| 1921..... | 27,000 | 1,087 | 29,340 | 24.1 | 893 | 10,522 | 19,116 | 4,453 |
| 1922..... | 23,400 | 1,186 | 27,744 | 8.6 | 1,295 | 13,497 | 12,401 | 4,556 |
| 1923..... | 18,440 | 1,071 | 19,751 | 18.8 | 761 | 20,461 | 19,832 | 3,815 |
| 1924..... | 20,350 | 1,360 | 27,670 | 10.3 | 439 | 16,122 | 15,737 | ⁴ 3,256 |
| 1925..... | 20,310 | 1,404 | 28,573 | 21.8 | 581 | 14,998 | 11,592 | ⁴ 3,426 |
| 1926..... | 20,800 | 1,516 | 31,522 | 23.1 | 470 | 13,369 | 12,936 | ⁴ 3,149 |
| 1927..... | 24,600 | 1,246 | 30,658 | 22.9 | 753 | 11,812 | 11,067 | ⁴ 3,071 |
| 1928..... | 20,200 | 1,257 | 32,944 | 19.3 | 649 | 8,836 | 8,198 | ..... |
| 1929 ⁵ | 24,900 | 1,334 | 33,220 | 11.4 | ..... | ..... | ..... | ..... |

Bureau of Agricultural Economics. Compiled from reports of the Division of Crop and Livestock Estimates, Bureau of Foreign and Domestic Commerce, records of the Bureau of Internal Revenue, and annual reports of the Commissioner of Prohibition.

¹ Compiled from Commerce and Navigation of the United States, 1910-1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1926; January and June issues, 1927-1929 and official records of the Bureau of Foreign and Domestic Commerce.

² Figures for 1919 and subsequent years represent hops used to make cereal beverages.

³ Less than 500 pounds.

⁴ Not including 57,936 pounds in 1921, 71,508 pounds in 1925, 960 pounds in 1926, and 6,294 pounds in 1927, used in the manufacture of distilled spirits

⁵ Preliminary.

TABLE 325.—*Hops: Acreage, yield per acre and production in specified countries, 1927-1929*

| Country | Acreage | | | Yield per acre | | | Production | | |
|---|--------------------|--------------|--------------------|----------------|---------------|-------------------|---------------------|---------------------|---------------------|
| | 1927 | 1928 | 1929, preliminary | 1927 | 1928 | 1929, preliminary | 1927 | 1928 | 1929, preliminary |
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| North America: | | | | | | | | | |
| Canada..... | 1,037 | 1,049 | ¹ 1,200 | 1,375 | 922 | ..... | 1,126 | 967 | ..... |
| United States ¹ | 24,000 | 26,200 | 24,900 | 1,246 | 1,257 | 1,334 | 30,658 | 32,944 | 33,220 |
| Europe: | | | | | | | | | |
| England and Wales..... | 23,004 | 23,805 | 23,986 | 1,244 | 1,139 | 1,677 | 28,616 | 27,115 | 40,219 |
| Belgium..... | 3,744 | 3,652 | 4,638 | 1,529 | 1,315 | 1,338 | 5,724 | 4,874 | 6,207 |
| France..... | 11,883 | 11,515 | 11,548 | 940 | 790 | 1,335 | 11,168 | 9,098 | 15,417 |
| Germany..... | 38,318 | 37,740 | 37,871 | 413 | 489 | 794 | 15,827 | 18,445 | 30,074 |
| Austria..... | 773 | 744 | ..... | 298 | 339 | ..... | 230 | 252 | ..... |
| Czechoslovakia..... | 31,130 | 39,615 | 43,000 | 768 | 525 | 464 | 23,922 | 20,799 | 19,941 |
| Hungary..... | 321 | 656 | ..... | 336 | 468 | ..... | 108 | 307 | ..... |
| Yugoslavia..... | 21,863 | 22,000 | 16,543 | 381 | 525 | 566 | 8,324 | 11,540 | ² 9,370 |
| Rumania..... | ..... | 146 | ..... | ..... | 390 | ..... | ..... | 57 | ..... |
| Poland..... | 5,683 | 8,678 | ³ 8,392 | 667 | 438 | 657 | 3,792 | 3,802 | ² 5,512 |
| Russia..... | ..... | ..... | ..... | ..... | ..... | ..... | ⁴ 6,753 | ..... | ..... |
| Total all countries reporting for all years..... | 161,262 | 174,254 | 172,078 | ..... | ..... | ..... | 128,031 | 128,617 | 159,900 |
| Oceania: | | | | | | | | | |
| Australia..... | ¹ 1,557 | ..... | ..... | 1,861 | ..... | ..... | 2,898 | ..... | ..... |
| New Zealand..... | 649 | ..... | ..... | 1,169 | ..... | ..... | 759 | ..... | ..... |
| Total countries reporting acreage and production for all years..... | 160,225 | 173,205 | 170,878 | 799 | 743 | 936 | 128,031 | 128,617 | 159,930 |
| Estimated world total, excluding Russia ⁵ | 164,703 | 178,000 | ..... | ..... | ..... | ..... | 133,502 | 133,898 | ..... |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Production figures are for the crop harvested in the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

¹ British Columbia.

² Unofficial estimate.

³ Principal producing States.

⁴ Production in Ukraine, where the bulk of the crop is grown.

⁵ Exclusive of acreage and production in minor producing countries for which no data are available.

TABLE 326.—Hops: International trade, average 1909-1913, annual 1925-1928

| Country | Year ended Dec. 31 | | | | | | | | | |
|-------------------------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|--------------|
| | Average 1909-1913 | | 1925 | | 1926 | | 1927 | | 1928 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| United States..... | 6,235 | 15,416 | 592 | 20,655 | 568 | 12,833 | 554 | 14,119 | 581 | 7,985 |
| Czechoslovakia..... | 0 | 0 | 1,787 | 12,389 | 1,195 | 16,222 | 1,139 | 17,904 | 1,628 | 14,451 |
| France..... | 5,436 | 335 | 4,015 | 9,114 | 3,931 | 9,159 | 5,407 | 5,682 | 4,345 | 3,612 |
| Yugoslavia..... | 0 | 0 | 298 | 6,964 | 169 | 6,945 | 273 | 9,030 | 198 | 16,920 |
| Poland..... | 0 | 0 | 308 | 1,661 | 330 | 1,850 | 593 | 3,843 | 367 | 4,705 |
| New Zealand..... | 61 | 352 | 2 | 340 | 18 | 393 | 4 | 530 | 1 | 408 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| Germany..... | 7,688 | 17,564 | 12,388 | 1,666 | 15,953 | 1,156 | 10,722 | 3,825 | 9,967 | 3,092 |
| Irish Free State..... | 0 | 0 | 6,758 | 0 | 6,575 | 0 | 5,174 | 0 | 5,852 | 0 |
| United Kingdom..... | 21,026 | 2,162 | 10,114 | 4,989 | 3,924 | 8,800 | 10,855 | 6,119 | 7,747 | 1,977 |
| Belgium..... | 6,915 | 4,814 | 4,621 | 3,989 | 4,626 | 3,110 | 4,489 | 1,853 | 6,479 | 1,433 |
| Canada..... | 1,396 | 176 | 3,524 | 85 | 2,165 | 357 | 1,962 | 709 | 2,307 | 488 |
| Austria..... | 1,938 | 18,333 | 3,058 | 127 | 2,977 | 130 | 2,924 | 62 | 5,141 | 201 |
| Netherlands..... | 2,938 | 1,405 | 961 | 207 | 931 | 135 | 1,536 | 24 | 1,216 | 50 |
| Japan..... | 253 | 0 | 968 | 0 | 798 | 0 | 1,011 | 0 | 1,002 | 0 |
| Sweden..... | 987 | 1 | 978 | 0 | 971 | 2 | 1,287 | 1 | 1,057 | 0 |
| Argentina..... | 618 | 0 | 1,142 | 0 | 1,000 | 0 | 1,042 | 0 | 0 | 0 |
| Switzerland..... | 1,257 | 32 | 828 | 0 | 977 | 0 | 1,072 | 0 | 1,189 | 0 |
| Denmark..... | 1,027 | 41 | 674 | 1 | 812 | 1 | 811 | 0 | 898 | 0 |
| Italy..... | 529 | 10 | 732 | 14 | 816 | 13 | 626 | 0 | 733 | 10 |
| Union of South Africa..... | 487 | 0 | 466 | 0 | 577 | 0 | 709 | 0 | 496 | 0 |
| Norway..... | 289 | 0 | 407 | 0 | 355 | 0 | 316 | 0 | 191 | 0 |
| Russia..... | 1,258 | 2,348 | 542 | 0 | 87 | 0 | 2 | 2 | 0 | 0 |
| Hungary..... | 0 | 0 | 275 | 82 | 356 | 123 | 444 | 146 | 278 | 188 |
| British India..... | 246 | 0 | 171 | 0 | 209 | 0 | 148 | 0 | 129 | 0 |
| Australia..... | 1,106 | 22 | 318 | 69 | 299 | 129 | 145 | 397 | 0 | 0 |
| Total, 25 countries..... | 60,692 | 62,941 | 55,867 | 62,352 | 50,619 | 58,388 | 53,295 | 61,243 | 49,943 | 55,529 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. Lupulin and hop/fennel (hop meal) are not included.

¹ Average for Austria-Hungary.

⁴ 3-year average.

² International Yearbook of Agricultural Statistics.

⁵ From original source.

³ 1 year only.

TABLE 327.—Peanuts: Acreage, yield per acre, production, and December 1 price, United States, 1916-1929

| Year | Total acreage, yield, and production | | | Nuts gathered | | | |
|-------------------------|--------------------------------------|----------------|-------------------------------|---------------|----------------|-------------------------|---------------------------------|
| | Total acreage ¹ | Yield per acre | Total production ² | Area | Yield per acre | Total quantity gathered | Farm price, Dec. 1 ³ |
| | 1,000 acres | Pounds | 1,000 lbs. | 1,000 acres | Pounds | 1,000 lbs. | Cents |
| 1916..... | | | | 1,043 | 881.1 | 919,028 | 4.49 |
| 1917..... | | | | 1,842 | 777.7 | 1,432,581 | 6.88 |
| 1918..... | | | | 1,865 | 664.9 | 1,240,102 | 6.47 |
| 1919..... | | | | 1,132 | 691.9 | 783,273 | 9.33 |
| 1920..... | | | | 1,181 | 712.5 | 841,474 | 5.26 |
| 1921..... | | | | 1,214 | 683.1 | 829,307 | 3.99 |
| 1922..... | | | | 1,005 | 630.0 | 633,114 | 4.68 |
| 1923..... | | | | 896 | 722.9 | 617,762 | 6.78 |
| 1924..... | 1,830 | 616.3 | 1,125,932 | 1,187 | 627.7 | 745,059 | 4.60 |
| 1925..... | 1,563 | 666.4 | 1,041,514 | 958 | 729.1 | 698,475 | 3.64 |
| 1926..... | 1,315 | 669.1 | 879,923 | 843 | 719.5 | 631,825 | 4.54 |
| 1927..... | 1,786 | 735.0 | 1,312,613 | 1,112 | 757.0 | 864,549 | 4.98 |
| 1928..... | 1,930 | 661.2 | 1,276,078 | 1,211 | 705.1 | 855,096 | 4.44 |
| 1929 ⁴ | 2,024 | 672.1 | 1,360,277 | 1,328 | 700.8 | 930,700 | 4.62 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Including acres planted in corn reduced to equivalent solid acres as well as the acreage grown alone.

² Including peanuts grazed or otherwise utilized as well as those gathered.

³ Farm prices are as of Nov. 15, 1916-1923; Dec. 1, 1924-1929.

⁴ Average price weighted on total production.

⁵ Preliminary.

TABLE 328.—*Peanuts: Acreage, yield per acre, production, and December 1 price, by States, 1926-1929*

| State | Nuts gathered | | | | | | | | | | | | | | | |
|-----------|----------------|----------------|----------------|-------------------|----------------|-------|-------|-------|---------------|---------------|---------------|-------------------|--------------------|------|------|------|
| | Acreage | | | | Yield per acre | | | | Production | | | | Farm price, Dec. 1 | | | |
| | 1926 | 1927 | 1928 | 1929 ¹ | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 ¹ | 1926 | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | Lbs. | Lbs. | Lbs. | Lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | Cts. | Cts. | Cts. | Cts. |
| Va..... | 138 | 152 | 152 | 160 | 990 | 810 | 928 | 913 | 136,620 | 123,120 | 141,056 | 146,080 | 4.3 | 4.5 | 4.7 | 3.9 |
| N. C..... | 180 | 211 | 205 | 220 | 1,030 | 954 | 1,050 | 1,020 | 185,400 | 201,294 | 215,250 | 224,400 | 4.2 | 4.5 | 4.9 | 4.0 |
| S. C..... | 8 | 11 | 10 | 10 | 675 | 775 | 690 | 735 | 5,400 | 8,525 | 6,900 | 7,350 | 5.2 | 3.7 | 4.2 | 3.4 |
| Ga..... | 211 | 304 | 350 | 343 | 525 | 725 | 540 | 650 | 110,775 | 220,400 | 189,000 | 222,950 | 4.9 | 3.9 | 4.4 | 3.4 |
| Fla..... | 39 | 44 | 44 | 46 | 680 | 640 | 575 | 600 | 26,520 | 28,160 | 25,300 | 27,600 | 4.5 | 3.7 | 4.2 | 3.5 |
| Tenn..... | 20 | 20 | 18 | 20 | 900 | 850 | 800 | 820 | 18,000 | 17,000 | 14,400 | 16,400 | 3.5 | 4.2 | 4.7 | 3.3 |
| Ala..... | 140 | 230 | 225 | 260 | 570 | 680 | 560 | 550 | 79,800 | 156,400 | 126,000 | 143,000 | 4.5 | 3.4 | 3.9 | 3.0 |
| Miss..... | 8 | 9 | 10 | 10 | 650 | 725 | 600 | 640 | 5,200 | 6,525 | 6,000 | 6,400 | 5.7 | 6.0 | 6.5 | 6.5 |
| Ark..... | 10 | 11 | 12 | 18 | 675 | 800 | 720 | 575 | 6,750 | 8,800 | 8,640 | 10,350 | 6.0 | 6.0 | 6.4 | 5.0 |
| La..... | 10 | 13 | 12 | 16 | 552 | 625 | 450 | 595 | 5,520 | 8,125 | 5,400 | 9,520 | 6.2 | 6.1 | 6.6 | 6.5 |
| Okla..... | 8 | 20 | 47 | 80 | 800 | 800 | 750 | 570 | 6,400 | 16,000 | 35,250 | 45,600 | 4.5 | 3.5 | 4.5 | 3.9 |
| Tex..... | 71 | 117 | 126 | 145 | 640 | 600 | 650 | 490 | 45,440 | 70,200 | 81,900 | 71,050 | 4.5 | 3.5 | 3.8 | 3.7 |
| U. S..... | 843.1 | 1,142.1 | 1,211.1 | 1,328.1 | 749.5 | 757.0 | 706.1 | 700.8 | 631,825 | 864,549 | 855,096 | 930,700 | 4.54 | 3.98 | 4.44 | 3.62 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.² Average price weighted on total production, which includes peanuts grazed or otherwise utilized as well as those gathered.TABLE 329.—*Peanuts: Estimated average price per pound, in the shell, received by producers, United States, 1910-1929*

| Year beginning November | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Weighted average |
|----------------------------|------------|------------|------------|------------|------------|------------|-----------|------------|------------|------------|-------------|------------|---------------------|
| | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| 1910..... | 4.7 | 4.5 | 4.4 | 5.0 | 4.8 | 4.9 | 4.8 | 5.2 | 5.0 | 5.3 | 5.1 | 4.6 | 4.6 |
| 1911..... | 4.4 | 4.4 | 4.3 | 4.7 | 5.0 | 4.9 | 4.9 | 5.2 | 4.9 | 5.0 | 4.8 | 4.7 | 4.4 |
| 1912..... | 4.7 | 4.6 | 4.6 | 4.5 | 4.7 | 4.8 | 4.7 | 5.0 | 5.1 | 4.9 | 4.9 | 4.8 | 4.6 |
| 1913..... | 4.4 | 4.8 | 4.7 | 4.7 | 4.7 | 4.9 | 5.1 | 5.1 | 5.2 | 4.9 | 5.0 | 4.5 | 4.6 |
| 1914..... | 4.4 | 4.3 | 4.5 | 4.4 | 4.2 | 4.5 | 4.8 | 4.8 | 4.7 | 4.5 | 4.4 | 4.3 | 4.4 |
| 1915..... | 4.2 | 4.2 | 4.3 | 4.4 | 4.4 | 4.6 | 4.6 | 4.7 | 4.6 | 4.6 | 4.4 | 4.4 | 4.3 |
| 1916..... | 4.4 | 4.7 | 4.9 | 5.3 | 5.5 | 6.2 | 7.2 | 7.7 | 7.6 | 7.2 | 6.6 | 6.1 | 4.8 |
| 1917..... | 7.1 | 7.1 | 7.0 | 7.2 | 7.4 | 8.3 | 8.2 | 7.9 | 7.8 | 7.9 | 8.3 | 6.9 | 7.1 |
| 1918..... | 6.6 | 6.1 | 6.0 | 6.9 | 7.0 | 6.9 | 7.2 | 7.7 | 8.2 | 8.1 | 8.3 | 8.1 | 6.5 |
| 1919..... | 9.1 | 9.1 | 9.9 | 10.5 | 11.2 | 10.9 | 11.2 | 11.2 | 11.0 | 8.5 | 8.0 | 5.8 | 9.2 |
| 1920..... | 5.3 | 4.7 | 4.4 | 4.1 | 4.0 | 3.5 | 3.4 | 3.8 | 3.8 | 3.9 | 4.0 | 4.0 | 4.7 |
| 1921..... | 3.7 | 3.5 | 3.6 | 4.0 | 4.3 | 3.9 | 3.9 | 4.2 | 4.4 | 4.4 | 4.7 | 3.6 | 3.7 |
| 1922..... | 5.2 | 5.0 | 5.9 | 6.5 | 6.7 | 7.1 | 7.1 | 7.3 | 6.9 | 6.7 | 6.7 | 7.0 | 5.5 |
| 1923..... | 6.8 | 6.2 | 6.4 | 6.7 | 6.8 | 6.7 | 6.4 | 6.5 | 6.4 | 6.6 | 6.4 | 6.4 | 6.5 |
| 1924..... | 6.3 | 5.6 | 5.4 | 5.5 | 5.9 | 5.7 | 6.2 | 6.2 | 5.4 | 5.2 | 5.7 | 4.7 | 5.7 |
| 1925..... | 5.1 | 4.4 | 4.5 | 4.7 | 4.6 | 5.1 | 5.0 | 4.7 | 5.3 | 5.3 | 5.1 | 4.9 | 4.7 |
| 1926..... | 4.6 | 4.7 | 4.9 | 5.4 | 5.6 | 5.7 | 5.9 | 6.6 | 6.4 | 6.4 | 6.0 | 4.9 | 4.8 |
| 1927..... | 4.6 | 5.2 | 5.4 | 5.4 | 5.4 | 5.5 | 5.7 | 5.6 | 5.5 | 5.5 | 5.0 | 4.6 | 5.0 |
| 1928..... | 4.8 | 5.1 | 5.0 | 5.1 | 5.1 | 5.2 | 5.0 | 5.1 | 4.9 | 4.7 | 4.6 | 4.4 | 4.9 |
| 1929..... | 4.0 | 3.8 | | | | | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of peanuts for each State; yearly price obtained by weighting monthly prices by estimated monthly marketings.

STATISTICS OF MISCELLANEOUS CROPS

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BLE 330.—*Peanuts: Monthly average prices of cleaned and shelled peanuts, for prompt shipment f. o. b. important shipping points, 1928-29*

VIRGINIA-NORTH CAROLINA SECTION: VIRGINIA, NORTH CAROLINA, AND TENNESSEE¹

| | 1928 | | 1929 | | | | | | | | | |
|------------------------|------|------|------|------|------|------|------|------|------|------|-------|------|
| | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. |
| Cleaned: | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| Virginias, Jumbos..... | 9¾ | 9¾ | 9½ | 9½ | 9½ | 8¾ | 8½ | 8½ | 8¾ | 8 | 7¾ | 7½ |
| Fancys..... | 6½ | 7¼ | 7¼ | 7¾ | 7¾ | 7 | 6¾ | 6¾ | 6¾ | 6½ | 6½ | 6½ |
| Extras..... | 6 | 6¾ | 6¾ | 6¾ | 6½ | 6½ | 6½ | 6 | 5¾ | 5¾ | 5¾ | 5¾ |
| Shelled, Virginias: | | | | | | | | | | | | |
| Extra large..... | 10½ | 10¾ | 11¼ | 11½ | 11¼ | 10¾ | 10½ | 10½ | 10¾ | 10¾ | 10¾ | 10½ |
| Virginias, No. 1..... | 7¾ | 8¾ | 8¾ | 9 | 8½ | 8¼ | 8½ | 8½ | 7¾ | 7¾ | 7¾ | 7¾ |
| Virginias, No. 2..... | 5¾ | 5¾ | 5¾ | 6 | 5½ | 5½ | 5½ | 5½ | 5½ | 5½ | 5½ | 5½ |

SOUTHEAST SECTION: SOUTH CAROLINA, GEORGIA, ALABAMA, AND FLORIDA²

| | | | | | | | | | | | | |
|---------------------|----|----|----|----|----|----|----|----|----|----|----|----|
| Shelled: | | | | | | | | | | | | |
| Spanish, No. 1..... | 7¼ | 7¾ | 7¾ | 7¾ | 6¾ | 6¾ | 6½ | 6½ | 6¼ | 6½ | 6½ | 6½ |
| Spanish, No. 2..... | 6¼ | 6½ | 6¾ | 6¾ | 6 | 5¾ | 5¾ | 5¾ | 5¾ | 5¾ | 5¾ | 5¾ |
| Runners, No. 1..... | 6¾ | 7¼ | 7¾ | 7 | 6¾ | 6½ | 6 | 5¾ | 5½ | 5½ | 5¾ | 5¾ |
| Runners, No. 2..... | 6 | 6½ | 6 | 5¾ | 5¾ | 5½ | 4¾ | 4¾ | 4¾ | 4¾ | 4¾ | 4¾ |

SOUTHWEST SECTION: TEXAS, OKLAHOMA, ARKANSAS³

| | | | | | | | | | | | | |
|---------------------|----|----|----|----|----|----|---|----|---|----|----|----|
| Shelled: | | | | | | | | | | | | |
| Spanish, No. 1..... | 7¼ | 7¾ | 7¾ | 7¾ | 7¼ | 7¼ | 7 | 7¼ | 7 | 6¾ | 6½ | 6¾ |
| Spanish, No. 2..... | 6½ | 6¾ | 6¾ | 6¾ | 6¼ | 6¾ | 6 | 6¼ | 6 | 5¾ | 5¾ | 5¾ |

Bureau of Agricultural Economics. Based on returns from cleaners, shellers, and brokers. Crop year extends from November to next October in the Virginia-North Carolina section; farther south it begins earlier. See 1927 Yearbook, p. 948, for data for earlier years.

¹ Important shipping points: Suffolk, Franklin, Petersburg, and Norfolk, Va., Edenton and Enfield N. C.

² Important shipping points: Albany, Cordele, Donalsonville, Camella, and Fort Gaines, Ga., Dothan, Enterprise, Troy, Montgomery, and Samson, Ala.

³ Important shipping points: Denison, Fort Worth, and De Leon, Tex.; Hugo, Okla.

TABLE 331.—*Peanut oil, crude and virgin: Peanuts used in production and quantity of oil produced in United States, 1919-1929*

| Year beginning Oct. 1 | Peanuts crushed ¹ | | | | | Oil produced | | | | |
|------------------------|------------------------------|---------------|------------|----------------|------------|------------------|---------------|------------|----------------|------------|
| | October-December | January-March | April-June | July-September | Total | October-December | January-March | April-June | July-September | Total |
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| 1919..... | 4,364 | 5,867 | 9,214 | 15,770 | 35,215 | 1,395 | 1,207 | 2,311 | 3,498 | 8,411 |
| 1920..... | 27,414 | 27,962 | 32,923 | 23,480 | 111,779 | 6,069 | 7,287 | 8,913 | 5,958 | 28,227 |
| 1921..... | 40,338 | 44,152 | 25,964 | 4,703 | 115,157 | 11,075 | 11,381 | 6,771 | 1,236 | 30,463 |
| 1922..... | 13,169 | 9,081 | 8,436 | 941 | 31,627 | 3,256 | 1,700 | 1,998 | 255 | 7,209 |
| 1923..... | 6,164 | 4,676 | 5,471 | 1,928 | 18,239 | 1,406 | 1,122 | 1,328 | 438 | 4,294 |
| 1924..... | 17,668 | 24,678 | 16,893 | 9,096 | 68,335 | 3,804 | 5,265 | 4,091 | 1,974 | 15,134 |
| 1925..... | 17,134 | 17,880 | 10,668 | 4,389 | 50,071 | 3,827 | 4,001 | 3,093 | 1,006 | 11,927 |
| 1926..... | 10,576 | 11,143 | 6,321 | 6,966 | 35,006 | 2,544 | 2,446 | 1,400 | 1,600 | 7,990 |
| 1927..... | 21,810 | 24,168 | 8,177 | 6,661 | 60,816 | 5,144 | 5,324 | 1,920 | 1,626 | 14,014 |
| 1928, preliminary..... | 14,740 | 19,594 | 10,392 | 10,192 | 54,918 | 3,569 | 4,463 | 2,331 | 2,309 | 12,672 |

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census "Animal and vegetable fats and oils."

¹ Quantities reported in terms of hulled have been converted to "in the hull" basis by multiplying by 1.5.

TABLE 333.—*Peanut oil: International trade, average 1909-1913, annual 1925-1928*

| Country | Year ended Dec. 31— | | | | | | | | | |
|--------------------------------|---------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------|--------------|
| | Average, 1909-1913 ¹ | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| Principal exporting countries: | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| China..... | 0 | 35,503 | 0 | 78,403 | 0 | 109,607 | 0 | 78,889 | 0 | 83,540 |
| France..... | 142 | 50,967 | 3,510 | 53,744 | 9,937 | 67,300 | 12,728 | 62,483 | 14,433 | 83,540 |
| Germany..... | 1,602 | ----- | 23,016 | 20,551 | 4,109 | 24,217 | 5,861 | 52,507 | 3,207 | 83,763 |
| Dutch East Indies..... | 2,090 | 45 | 1,315 | 1,648 | 1,581 | 831 | 1,756 | 1,843 | 467 | 2,074 |
| Principal importing countries: | | | | | | | | | | |
| Netherlands..... | 2,743 | 18,569 | 40,209 | 29,336 | 59,916 | 26,892 | 61,789 | 34,735 | 71,595 | 31,865 |
| United Kingdom..... | ----- | ----- | 25,148 | 25,431 | 23,678 | 22,100 | 46,411 | 9,374 | ----- | ----- |
| Algeria..... | ----- | ----- | 23,542 | 460 | 21,802 | 402 | 23,477 | 231 | 31,884 | ----- |
| Canada..... | ----- | 0 | 16,134 | 0 | 38,794 | 0 | 4,811 | 0 | 11,186 | 0 |
| United States..... | 7,295 | 0 | 3,027 | 0 | 8,281 | 0 | 2,847 | 0 | 4,749 | 0 |
| Norway..... | ----- | 0 | 8,433 | 0 | 8,101 | 0 | 7,124 | 0 | 7,505 | 0 |
| Italy..... | 8,807 | 4 | 9,074 | 105 | 14,908 | 106 | 16,589 | 171 | 18,053 | 82 |
| Sweden..... | 2,459 | ----- | 6,755 | 697 | 8,178 | 1,141 | 4,701 | 4,249 | 6,729 | 2,819 |
| Belgium..... | 2,233 | 2,065 | 9,184 | 5,030 | 6,816 | 4,879 | 6,526 | 5,608 | 10,048 | 3,660 |
| Philippine Islands..... | 976 | 0 | 3,286 | 0 | 4,030 | 0 | 5,483 | 0 | 3,892 | 0 |
| Morocco..... | ----- | 0 | 1,894 | 0 | 1,615 | 0 | 1,163 | 0 | ----- | ----- |
| Denmark..... | 2,941 | 156 | 1,889 | 1,743 | 1,086 | 1,829 | 1,399 | 2,743 | 840 | ----- |
| Czechoslovakia..... | 0 | ----- | 1,512 | 0 | 1,433 | 55 | 3,510 | 81 | 3,904 | 280 |
| Total, 17 countries..... | 31,348 | 107,399 | 177,928 | 214,123 | 220,268 | 259,419 | 206,175 | 252,964 | 194,092 | 218,987 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. Conversion made on the basis of 7.5 pounds to the gallon.

¹ International Institute of Agriculture, "Oleaginous Products and Vegetable Oils."

² 4-year average.

³ 2-year average.

⁴ Java and Madura only.

⁵ 3-year average.

TABLE 334.—*Peanut oil, refined: Average price per pound, in barrels, at New York, 1916-1929*

| Year beginning Sep- | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Average |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1916..... | 12.19 | 12.60 | 13.33 | 13.49 | 13.50 | 14.38 | 14.80 | 17.58 | 17.83 | 17.87 | 17.44 | 18.05 | 15.26 |
| 1917..... | 18.61 | 20.12 | 21.67 | 22.67 | 22.49 | 22.98 | 22.33 | 22.41 | 21.70 | 21.15 | 21.17 | 21.78 | 21.62 |
| 1918..... | 21.44 | 22.75 | 22.75 | 21.06 | 20.36 | 20.25 | 19.90 | 22.38 | 24.58 | 26.91 | 29.31 | 30.05 | 23.48 |
| 1919..... | 26.25 | 25.25 | 26.68 | 26.69 | 27.50 | 26.43 | 27.12 | 25.00 | 23.10 | 20.88 | 19.00 | 17.19 | 24.26 |
| 1920..... | 16.88 | 16.20 | 14.62 | 12.75 | 12.52 | 12.34 | 11.00 | 10.70 | 10.50 | 10.25 | 10.00 | 10.12 | 12.32 |
| 1921..... | 10.62 | 11.75 | 11.59 | 11.22 | 11.25 | 11.38 | 12.25 | 13.15 | 13.00 | 13.00 | 12.48 | 12.62 | 12.03 |
| 1922..... | 12.40 | 12.25 | 13.03 | 14.25 | 16.88 | 17.38 | 17.85 | 17.75 | 16.56 | 16.00 | 16.00 | 16.00 | 15.55 |
| 1923..... | 16.00 | 16.00 | 15.59 | 14.80 | 14.75 | 14.75 | 14.75 | 14.75 | 14.88 | 15.25 | 15.25 | 15.56 | 15.19 |
| 1924..... | 16.45 | 16.25 | 16.25 | 16.25 | 16.75 | 16.75 | 16.75 | 16.75 | 15.20 | 15.00 | 15.00 | 15.00 | 16.03 |
| 1925..... | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.50 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 | 15.54 |
| 1926..... | 15.00 | 15.00 | 15.50 | 14.62 | 14.50 | 14.50 | 14.50 | 14.50 | 14.50 | 14.50 | 14.50 | 14.50 | 14.84 |
| 1927..... | 14.50 | 14.50 | 14.30 | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 | 13.73 |
| 1928..... | 13.50 | 13.50 | 12.25 | 11.00 | 13.50 | 13.50 | 13.50 | 13.44 | 13.25 | 13.25 | 13.25 | 13.25 | 13.10 |
| 1929..... | 13.25 | 13.25 | 13.25 | 13.25 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from Oil, Paint, and Drug Reporter, average of weekly range.

TABLE 335.—*Clover seed: Receipts, Chicago, 1920-1928*

| Year beginning Sep- tember | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Total |
|-------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| 1920..... | 1,207 | 969 | 747 | 1,004 | 2,288 | 2,165 | 4,062 | 1,570 | 418 | 164 | 84 | 365 | 15,043 |
| 1921..... | 739 | 1,235 | 2,040 | 1,833 | 1,628 | 2,674 | 2,448 | 1,009 | 279 | 169 | 77 | 997 | 15,128 |
| 1922..... | 1,358 | 1,203 | 1,479 | 1,214 | 1,044 | 620 | 1,825 | 845 | 350 | 109 | 8 | 272 | 10,426 |
| 1923..... | 641 | 1,681 | 1,176 | 1,039 | 630 | 1,641 | 2,054 | 1,352 | 259 | 41 | 1 | 40 | 10,555 |
| 1924..... | 346 | 888 | 2,195 | 1,801 | 1,500 | 1,507 | 1,574 | 765 | 9 | 27 | 68 | 328 | 11,008 |
| 1925..... | 393 | 946 | 2,125 | 2,603 | 1,984 | 2,079 | 2,888 | 849 | 487 | 28 | 107 | 366 | 14,855 |
| 1926..... | 1,107 | 3,596 | 2,133 | 1,350 | 1,695 | 1,857 | 1,671 | 546 | 55 | ----- | ----- | 64 | 14,074 |
| 1927..... | 575 | 2,285 | 4,689 | 1,544 | 1,557 | 1,522 | 1,313 | 848 | 268 | 40 | 165 | 168 | 14,974 |
| 1928..... | 958 | 3,125 | 2,751 | 1,746 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade.

TABLE 336.—*Clover, alfalfa, and timothy seed: Production and December 1 price, United States, 1916-1929*

| Year | Production | | | | Price per bushel received by producers Dec. 1 | | | |
|-------------------------|------------------------------------|------------------------|-----------------|-----------------|--|--------------------------|-----------------|-----------------|
| | Clover seed (red and alsike) | Sweet-clo- ver seed | Alfalfa seed | Timothy seed | Clover seed (red and alsike) 1 | Sweet- clover seed | Alfalfa seed | Timothy seed |
| | Bushels | Bushels | Bushels | Bushels | Dollars | Dollars | Dollars | Dollars |
| 1916..... | ² 1,706,000 | ----- | ----- | ----- | 9.18 | ----- | ----- | ----- |
| 1917..... | ² 1,488,000 | ----- | ----- | ----- | 12.84 | ----- | ----- | ----- |
| 1918..... | ² 1,197,000 | ----- | ----- | ----- | 19.80 | ----- | ----- | ----- |
| 1919..... | ² 1,545,000 | ----- | ----- | ----- | 26.52 | ----- | ----- | ----- |
| 1920..... | ² 2,023,000 | ----- | ----- | ----- | 11.60 | ----- | ----- | ----- |
| 1921..... | ² 1,422,000 | ----- | ----- | ----- | 10.05 | ----- | ----- | ----- |
| 1922..... | ² 1,815,000 | ----- | ----- | ----- | 10.03 | ----- | ----- | ----- |
| 1923..... | ² 1,028,000 | ----- | ----- | ----- | 12.05 | ----- | ----- | ----- |
| 1924..... | 927,000 | 767,800 | 1,002,100 | 2,730,800 | 14.51 | 6.81 | 10.69 | 3.16 |
| 1925..... | 1,032,000 | 1,058,900 | 1,107,500 | 1,950,800 | 14.90 | 4.87 | 10.48 | 3.43 |
| 1926..... | 728,000 | 1,140,100 | 958,300 | 2,529,100 | 17.71 | 6.99 | 9.80 | 2.62 |
| 1927..... | 1,727,000 | 1,223,800 | 851,400 | 3,016,000 | 15.22 | 4.67 | 9.28 | 1.82 |
| 1928..... | 961,000 | 909,400 | 532,400 | 1,229,400 | 16.22 | 3.75 | 12.24 | 2.20 |
| 1929 ³ | 2,157,000 | 961,800 | 717,800 | 1,407,200 | 10.16 | 3.74 | 10.69 | 2.23 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ From 1916 to 1924, Nov. 15 price; 1925-1929, Dec. 1 price.² Includes "sweet clover."³ Preliminary.TABLE 337.—*Clover seed (red and alsike): Acreage, yield per acre, production, and December 1 price, by States, 1927-1929*

| State | Acreage | | | Average yield per acre | | | Production | | | Price per bushel received by pro- ducers Dec. 1 | | |
|--------------------|----------------|----------------|-------------------|---------------------------|-------|-------|----------------|----------------|-------------------|---|--------|--------|
| | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | Bush. | Bush. | Bush. | 1,000 bush. | 1,000 bush. | 1,000 bush. | Dolls. | Dolls. | Dolls. |
| New York..... | 1 | 1 | 3 | 1.8 | 1.8 | 2.3 | 2 | 2 | 7 | 19.00 | 19.70 | 14.00 |
| Pennsylvania..... | 14 | 16 | 14 | 1.6 | 1.6 | 2.0 | 22 | 26 | 28 | 17.75 | 17.75 | 15.25 |
| Ohio..... | 268 | 161 | 322 | 1.2 | 1.2 | 1.6 | 322 | 193 | 515 | 16.00 | 16.90 | 10.20 |
| Indiana..... | 210 | 80 | 300 | 1.2 | 1.2 | 1.3 | 252 | 96 | 390 | 15.00 | 16.70 | 9.80 |
| Illinois..... | 187 | 75 | 180 | 1.1 | 1.1 | 1.3 | 206 | 82 | 234 | 15.00 | 17.00 | 10.25 |
| Michigan..... | 97 | 63 | 151 | 1.6 | 1.6 | 1.7 | 155 | 101 | 257 | 14.70 | 16.10 | 9.50 |
| Wisconsin..... | 138 | 36 | 85 | 1.9 | 1.4 | 1.6 | 262 | 50 | 136 | 15.50 | 16.50 | 9.90 |
| Minnesota..... | 80 | 53 | 64 | 2.0 | 2.0 | 1.9 | 160 | 106 | 122 | 15.50 | 16.00 | 10.50 |
| Iowa..... | 123 | 38 | 114 | .84 | 1.3 | 1.35 | 103 | 49 | 154 | 16.10 | 18.00 | 11.00 |
| Missouri..... | 33 | 23 | 58 | 1.7 | 1.5 | 1.5 | 56 | 34 | 87 | 13.50 | 14.80 | 9.60 |
| North Dakota..... | 3 | 3 | 2 | 2.0 | 2.0 | 3.0 | 6 | 6 | 6 | 13.50 | 15.00 | 9.60 |
| Nebraska..... | 12 | 14 | 18 | 1.7 | 1.5 | 1.7 | 20 | 21 | 31 | 15.15 | 15.60 | 11.00 |
| Kansas..... | 12 | 6 | 9 | 1.6 | 1.5 | 1.6 | 19 | 9 | 14 | 13.10 | 13.60 | 9.70 |
| Tennessee..... | 3 | 3 | 10 | 2.0 | 1.9 | 2.1 | 6 | 6 | 21 | 18.00 | 17.10 | 13.75 |
| Idaho..... | 18 | 21 | 19 | 4.7 | 4.7 | 4.2 | 84 | 99 | 80 | 13.50 | 14.60 | 9.20 |
| Colorado..... | ----- | 1 | 2 | ----- | 5.0 | 6.0 | ----- | 5 | 12 | ----- | 15.60 | 11.55 |
| Oregon..... | 15 | 23 | 18 | 3.5 | 3.3 | 3.5 | 52 | 76 | 63 | 14.25 | 14.90 | 9.95 |
| United States..... | 1,214 | 617 | 1,369 | 1.42 | 1.56 | 1.58 | 1,727 | 961 | 2,157 | 15.22 | 16.22 | 10.16 |

Bureau of Agricultural Economics. Estimates of the crop reporting board.

Preliminary.

TABLE 338.—*Sweetclover seed: Acreage, yield per acre, production, and December 1 price, by States, 1927-1929*

| State | Acreage | | | Average yield per acre | | | Production | | | Price per bushel received by producers Dec. 1 | | |
|-------------------|-------------|-------------|-------------------|------------------------|---------|---------|------------|---------|-------------------|---|---------|---------|
| | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | Bushels | Bushels | Bushels | Bushels | Bushels | Bushels | Dollars | Dollars | Dollars |
| Ohio..... | 10 | 6 | 7 | 3.8 | 3.5 | 3.6 | 38,000 | 21,000 | 25,200 | 6.20 | 5.80 | 4.80 |
| Indiana..... | 6 | 3 | 2 | 2.0 | 3.0 | 3.0 | 12,000 | 9,000 | 6,000 | 6.50 | 5.80 | 5.30 |
| Illinois..... | 20 | 13 | 17 | 3.7 | 4.0 | 4.0 | 74,000 | 52,000 | 68,000 | 7.00 | 5.30 | 5.10 |
| Minnesota..... | 50 | 30 | 24 | 4.0 | 4.1 | 5.0 | 200,000 | 123,000 | 120,000 | 3.50 | 3.40 | 3.30 |
| Iowa..... | 26 | 14 | 28 | 4.3 | 4.4 | 3.5 | 111,800 | 61,600 | 98,000 | 5.70 | 5.30 | 4.95 |
| Missouri..... | 5 | 6 | 7 | 3.5 | 3.0 | 3.7 | 17,500 | 18,000 | 25,900 | 6.00 | 5.40 | 4.50 |
| North Dakota..... | 55 | 50 | 50 | 4.2 | 3.7 | 4.2 | 231,000 | 185,000 | 210,000 | 4.25 | 3.50 | 3.55 |
| South Dakota..... | 45 | 54 | 49 | 4.2 | 4.3 | 4.3 | 189,000 | 232,200 | 210,700 | 4.20 | 3.00 | 3.30 |
| Nebraska..... | 33 | 22 | 24 | 3.9 | 3.7 | 4.3 | 128,700 | 81,400 | 103,200 | 5.00 | 3.93 | 3.10 |
| Kansas..... | 34 | 17 | 17 | 4.0 | 4.1 | 3.9 | 136,800 | 69,700 | 66,300 | 4.35 | 3.30 | 3.40 |
| Montana..... | 6 | 7 | 3 | 5.0 | 4.5 | 4.5 | 30,000 | 31,500 | 13,500 | 6.00 | 4.30 | 4.30 |
| Colorado..... | 10 | 5 | 3 | 5.5 | 5.0 | 5.0 | 55,000 | 25,000 | 15,000 | 4.50 | 3.70 | 3.55 |
| United States.. | 300 | 227 | 231 | 4.08 | 4.01 | 4.16 | 1,223,800 | 909,400 | 961,800 | 4.67 | 3.75 | 3.74 |

Bureau of Agricultural Economics. Estimates of the crop reporting board.

¹ Preliminary.TABLE 339.—*Lespedeza (Japan clover) seed: Acreage, yield per acre, production, and December 1 price, by States, 1927-1929*

| State | Acreage | | | Average yield per acre | | | Production | | | Price per bushel received by producers Dec. 1 | | |
|------------------|-------------|-------------|-------------------|------------------------|-------|-------|------------|---------|-------------------|---|--------|--------|
| | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | Bush. | Bush. | Bush. | Bushels | Bushels | Bushels | Dolls. | Dolls. | Dolls. |
| Tennessee..... | 10 | 10 | 15 | 4.0 | 4.0 | 4.0 | 40,000 | 40,000 | 60,000 | 2.50 | 2.50 | 2.75 |
| Mississippi..... | 31 | 24 | 22 | 6.2 | 4.7 | 6.0 | 192,500 | 112,800 | 132,000 | 2.81 | 2.79 | 3.35 |
| Louisiana..... | 5 | 6 | 5 | 5.2 | 5.2 | 3.0 | 28,100 | 31,200 | 15,000 | 2.45 | 3.21 | 3.60 |
| United States.. | 46 | 40 | 42 | 5.62 | 4.60 | 4.93 | 260,600 | 184,000 | 207,000 | 2.72 | 2.80 | 3.19 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.TABLE 340.—*Timothy seed: Acreage, yield per acre, production, and December 1 price, by States, 1927-1929*

| State | Acreage | | | Average yield per acre | | | Production | | | Price per bushel received by producers Dec. 1 | | |
|-------------------|-------------|-------------|-------------------|------------------------|-------|-------|------------|-----------|-------------------|---|--------|--------|
| | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | Bush. | Bush. | Bush. | Bushels | Bushels | Bushels | Dolls. | Dolls. | Dolls. |
| New York..... | 2 | 3 | 3 | 4.8 | 5.0 | 3.3 | 9,600 | 15,000 | 9,000 | 4.00 | 2.80 | 3.00 |
| Pennsylvania..... | 10 | 8 | 7 | 4.8 | 5.5 | 4.8 | 48,000 | 44,000 | 33,600 | 2.85 | 2.90 | 3.20 |
| Ohio..... | 90 | 40 | 60 | 4.4 | 4.3 | 4.2 | 396,000 | 172,000 | 210,000 | 2.10 | 2.20 | 2.25 |
| Indiana..... | 25 | 10 | 8 | 4.0 | 3.8 | 4.0 | 100,000 | 38,000 | 32,000 | 2.15 | 2.20 | 2.25 |
| Illinois..... | 130 | 65 | 78 | 4.4 | 3.5 | 4.0 | 572,000 | 227,500 | 312,000 | 1.85 | 2.20 | 2.20 |
| Wisconsin..... | 12 | 4 | 4 | 4.4 | 4.6 | 4.0 | 53,000 | 18,400 | 16,000 | 2.25 | 2.40 | 2.45 |
| Minnesota..... | 40 | 12 | 12 | 4.2 | 3.7 | 4.2 | 168,000 | 44,400 | 50,400 | 1.70 | 2.15 | 2.20 |
| Iowa..... | 256 | 104 | 125 | 4.2 | 3.6 | 4.0 | 1,075,200 | 374,400 | 500,000 | 1.65 | 2.15 | 2.20 |
| Missouri..... | 135 | 71 | 64 | 3.8 | 3.5 | 3.0 | 513,000 | 248,500 | 192,000 | 1.75 | 2.15 | 2.20 |
| North Dakota..... | 5 | 2 | 2 | 2.8 | 3.5 | 3.0 | 14,000 | 7,000 | 6,000 | 1.85 | 2.15 | 2.20 |
| South Dakota..... | 15 | 11 | 11 | 4.0 | 3.0 | 3.5 | 60,000 | 33,000 | 38,500 | 1.75 | 1.90 | 1.90 |
| Kansas..... | 2 | 2 | 2 | 3.6 | 3.6 | 3.4 | 7,200 | 7,200 | 6,800 | 1.90 | 1.90 | 2.00 |
| United States.. | 722 | 332 | 366 | 4.18 | 3.70 | 3.84 | 3,016,000 | 1,223,400 | 1,407,200 | 1.82 | 2.20 | 2.23 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Preliminary.

TABLE 341.—*Alfalfa seed: Acreage, yield per acre, production, and December 1 price, by States, 1927-1929*

| State | Acreage | | | Average yield per acre | | | Production | | | Price per bushel received by producers Dec. 1 | | |
|--------------------|-------------|-------------|-------------------|------------------------|-------|-------|------------|---------|-------------------|---|--------|--------|
| | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 ¹ | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | Bush. | Bush. | Bush. | Bushels | Bushels | Bushels | Dolls. | Dolls. | Dolls. |
| Minnesota..... | 4 | 4 | 4 | 1.7 | 1.8 | 2.0 | 6,500 | 6,800 | 8,400 | 16.35 | 19.40 | 13.95 |
| Missouri..... | 3 | 3 | 3 | 3.5 | 3.0 | 2.0 | 10,500 | 9,000 | 6,000 | 13.95 | 15.50 | 12.00 |
| North Dakota.... | 4 | 4 | 15 | 1.8 | 1.9 | 2.0 | 7,200 | 7,600 | 30,000 | 17.10 | 19.00 | 16.80 |
| South Dakota.... | 18 | 22 | 28 | 1.6 | 2.0 | 2.1 | 28,800 | 44,000 | 58,800 | 13.00 | 13.45 | 12.95 |
| Nebraska..... | 19 | 9 | 14 | 2.2 | 2.2 | 3.3 | 41,800 | 19,800 | 46,200 | 11.50 | 12.35 | 11.75 |
| Kansas..... | 8 | 8 | 20 | 2.2 | 2.4 | 2.5 | 18,000 | 19,000 | 50,000 | 9.15 | 10.85 | 11.00 |
| Oklahoma..... | 12 | 10 | 11 | 3.0 | 2.6 | 3.0 | 36,000 | 28,000 | 33,000 | 8.45 | 9.30 | 10.00 |
| Texas..... | 7 | 3 | 3 | 4.0 | 1.5 | 2.9 | 28,800 | 4,000 | 7,500 | 8.25 | 9.00 | 9.80 |
| Montana..... | 11 | 20 | 30 | 1.8 | 2.4 | 2.4 | 19,800 | 48,000 | 72,000 | 13.00 | 13.90 | 11.50 |
| Idaho..... | 30 | 15 | 23 | 6.0 | 3.4 | 4.0 | 180,000 | 51,000 | 92,000 | 9.25 | 13.30 | 9.20 |
| Wyoming..... | 3 | 3 | 3 | 3.0 | 3.0 | 2.3 | 9,000 | 9,000 | 6,900 | 12.25 | 13.10 | 10.35 |
| Colorado..... | 3 | 2 | 5 | 3.5 | 3.0 | 4.0 | 10,200 | 6,000 | 20,000 | 10.75 | 11.80 | 10.10 |
| New Mexico..... | 6 | 6 | 6 | 4.5 | 3.0 | 3.5 | 22,200 | 16,500 | 21,000 | 8.20 | 10.15 | 10.00 |
| Arizona..... | 22 | 22 | 22 | 5.0 | 4.5 | 4.5 | 110,000 | 99,000 | 100,000 | 8.20 | 11.60 | 10.10 |
| Utah..... | 72 | 52 | 55 | 3.48 | 2.1 | 1.9 | 265,000 | 110,000 | 107,000 | 8.25 | 11.50 | 8.70 |
| Oregon..... | 1 | 3 | 3 | 4.0 | 3.5 | 3.8 | 4,000 | 10,500 | 11,400 | 11.75 | 12.75 | 12.00 |
| California..... | 13 | 14 | 14 | 3.5 | 3.3 | 3.5 | 46,600 | 46,200 | 47,600 | 9.60 | 11.70 | 10.20 |
| United States..... | 237 | 199 | 258 | 3.59 | 2.68 | 2.78 | 851,400 | 532,400 | 717,800 | 9.28 | 12.24 | 10.69 |

Bureau of Agricultural Economics. Estimates of the crop reporting board.

¹ Preliminary.TABLE 342.—*Timothy seed: Receipts, Chicago, 1920-1928*

| Year beginning August | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Total |
|-----------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| 1920..... | 2,347 | 8,075 | 5,676 | 4,009 | 2,951 | 1,706 | 2,076 | 4,056 | 2,601 | 2,368 | 1,088 | 579 | 37,532 |
| 1921..... | 10,849 | 6,239 | 4,586 | 3,198 | 2,317 | 2,404 | 2,899 | 2,828 | 780 | 1,263 | 472 | 119 | 37,954 |
| 1922..... | 8,967 | 9,593 | 4,577 | 2,048 | 1,050 | 570 | 1,352 | 1,697 | 1,243 | 398 | 355 | 124 | 31,974 |
| 1923..... | 5,366 | 13,397 | 4,419 | 1,606 | 1,329 | 662 | 1,298 | 1,815 | 1,162 | 65 | 315 | 507 | 31,961 |
| 1924..... | 3,698 | 12,714 | 4,845 | 3,736 | 1,552 | 2,138 | 2,038 | 2,568 | 1,809 | 1,240 | 664 | 687 | 37,687 |
| 1925..... | 5,933 | 7,599 | 5,009 | 2,047 | 1,651 | 2,499 | 1,801 | 2,316 | 1,734 | 1,015 | 667 | 672 | 32,943 |
| 1926..... | 5,907 | 7,981 | 3,368 | 2,113 | 1,158 | 1,588 | 1,780 | 2,601 | 1,481 | 980 | 779 | 516 | 30,252 |
| 1927..... | 6,548 | 7,387 | 3,741 | 3,812 | 961 | 1,170 | 1,669 | 1,826 | 1,625 | 1,613 | 1,039 | 896 | 32,287 |
| 1928..... | 1,652 | 5,664 | 3,164 | 956 | 921 | | | | | | | | |

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade.

TABLE 343.—*Alfalfa seed: Estimated average price per bushel, received by producers, United States, 1920-1929*

| Year beginning August | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Weighted average ¹ |
|-----------------------|---------|----------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|-------------------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1920..... | 16.03 | 14.89 | 13.35 | 12.25 | 10.24 | 9.95 | 9.01 | 9.31 | 8.71 | 8.97 | 8.73 | 7.89 | 11.74 |
| 1921..... | 8.51 | 8.53 | 8.33 | 8.09 | 7.63 | 7.39 | 8.45 | 7.50 | 9.00 | 8.89 | 8.48 | 9.00 | 8.22 |
| 1922..... | 7.74 | 8.00 | 7.94 | 8.50 | 9.45 | 9.58 | 9.96 | 10.56 | 10.44 | 10.59 | 10.57 | 10.25 | 9.36 |
| 1923..... | 10.38 | 9.20 | 10.75 | 10.21 | 10.19 | 10.43 | 10.51 | 11.17 | 11.41 | 11.67 | 11.39 | 11.13 | 10.63 |
| 1924..... | 10.99 | 10.74 | 10.39 | 10.16 | 10.33 | 10.52 | 11.05 | 11.72 | 12.73 | 12.00 | 10.99 | 11.41 | 10.62 |
| 1925..... | 9.88 | 10.51 | 10.30 | 10.65 | 9.87 | 9.51 | 9.48 | 9.82 | 9.94 | 9.92 | 10.22 | 9.79 | 9.99 |
| 1926..... | 9.37 | 9.17 | 8.94 | 9.42 | 9.48 | 10.12 | 10.33 | 10.50 | 11.04 | 10.63 | 10.62 | 10.17 | 9.45 |
| 1927..... | 9.62 | 9.69 | 9.78 | 9.98 | 9.74 | 9.55 | 9.74 | 10.11 | 10.35 | 10.52 | 10.91 | 10.24 | 9.87 |
| 1928..... | 10.38 | 10.25 | 10.71 | 11.96 | 12.69 | 12.67 | 13.19 | 13.84 | 14.19 | 14.69 | 14.91 | 14.68 | 11.37 |
| 1929..... | 13.52 | 12.85 | 11.68 | 10.83 | 11.10 | 11.15 | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of alfalfa seed for each State; yearly price obtained by weighting monthly prices by monthly marketings.

¹ Straight crop year average until 1924.

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TABLE 344.—Clover seed: Estimated average price per bushel, received by producers, United States, 1920-1929

| Year beginning September | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Weight- ed aver- age |
|-----------------------------|-------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|------------|------------|----------------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1920..... | 17.77 | 13.18 | 11.64 | 10.28 | 10.82 | 10.61 | 10.98 | 10.80 | 10.71 | 10.20 | 10.00 | 10.37 | 11.81 |
| 1921..... | 10.25 | 10.21 | 10.09 | 10.38 | 10.69 | 11.88 | 13.00 | 13.13 | 12.84 | 11.60 | 11.00 | 9.88 | 11.14 |
| 1922..... | 8.85 | 9.68 | 10.18 | 10.88 | 11.16 | 11.52 | 11.71 | 11.48 | 11.20 | 10.84 | 10.94 | 10.46 | 10.71 |
| 1923..... | 11.07 | 12.20 | 12.18 | 12.22 | 12.51 | 12.67 | 13.04 | 13.09 | 13.07 | 12.72 | 12.42 | 12.09 | 12.38 |
| 1924..... | 12.15 | 12.80 | 13.42 | 15.31 | 16.17 | 16.95 | 18.19 | 17.40 | 16.82 | 15.48 | 15.67 | 14.86 | 15.35 |
| 1925..... | 13.42 | 14.42 | 14.85 | 15.48 | 16.04 | 16.83 | 17.45 | 17.88 | 18.08 | 17.16 | 17.17 | 16.83 | 15.87 |
| 1926..... | 16.63 | 17.21 | 17.85 | 17.89 | 19.07 | 20.18 | 21.16 | 22.75 | 22.45 | 22.07 | 20.69 | 17.94 | 19.06 |
| 1927..... | 16.78 | 15.67 | 15.07 | 15.33 | 15.97 | 16.37 | 16.90 | 16.92 | 17.04 | 16.89 | 16.42 | 15.90 | 16.11 |
| 1928..... | 16.26 | 16.49 | 16.68 | 16.81 | 16.96 | 17.37 | 17.54 | 17.96 | 17.90 | 17.62 | 17.17 | 16.30 | 16.99 |
| 1929..... | 12.48 | 10.68 | 9.75 | 9.94 | | | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of clover seed for each State; yearly prices obtained by weighting monthly prices by average monthly marketings.

TABLE 345.—Timothy seed: Estimated average price per bushel, received by producers, United States, 1920-1929

| Year beginning August | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Weight- ed aver- age |
|--------------------------|------------|-------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|------------|----------------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1920..... | 4.44 | 3.52 | 3.25 | 3.09 | 3.16 | 3.04 | 2.75 | 2.97 | 2.84 | 2.90 | 2.99 | 2.98 | 3.29 |
| 1921..... | 2.71 | 2.31 | 2.70 | 2.41 | 2.57 | 2.70 | 2.82 | 2.95 | 3.11 | 3.21 | 2.81 | 2.53 | 2.64 |
| 1922..... | 2.20 | 2.28 | 2.48 | 2.49 | 2.69 | 3.06 | 2.98 | 3.00 | 2.99 | 2.87 | 2.92 | 3.16 | 2.60 |
| 1923..... | 2.63 | 3.01 | 3.12 | 3.15 | 3.19 | 3.37 | 3.56 | 3.60 | 3.54 | 3.48 | 3.44 | 3.23 | 3.19 |
| 1924..... | 3.20 | 3.12 | 3.16 | 2.88 | 3.03 | 3.04 | 3.03 | 3.15 | 3.24 | 3.10 | 3.05 | 3.47 | 3.11 |
| 1925..... | 3.36 | 3.21 | 3.21 | 3.31 | 3.41 | 3.38 | 3.56 | 3.51 | 3.47 | 3.36 | 3.41 | 3.26 | 3.33 |
| 1926..... | 2.68 | 2.55 | 2.61 | 2.46 | 2.58 | 2.62 | 2.70 | 2.69 | 2.76 | 2.69 | 2.76 | 2.58 | 2.61 |
| 1927..... | 2.06 | 1.66 | 1.58 | 1.61 | 1.73 | 1.78 | 1.92 | 1.86 | 1.88 | 1.96 | 2.08 | 2.07 | 1.77 |
| 1928..... | 1.86 | 1.91 | 2.08 | 2.20 | 2.20 | 2.41 | 2.49 | 2.62 | 2.67 | 2.65 | 2.56 | 2.36 | 2.20 |
| 1929..... | 1.69 | 1.88 | 2.02 | 2.17 | 2.25 | | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production of timothy seed for each State; yearly prices obtained by weighting monthly prices by average monthly marketings.

TABLE 346.—*Field seeds: Average wholesale selling price per 100 pounds at specified markets, by months, 1920-1929*

| Year | Alfalfa, common, Kansas City | | | | | Alsike clover, Chicago | | | | |
|-----------|---------------------------------|---------|---------|---------|---------|---------------------------|---------|---------|---------|---------|
| | Jan. | Feb. | Mar. | Apr. | May | Jan. | Feb. | Mar. | Apr. | May |
| | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 1920..... | 42.00 | 42.00 | 40.25 | 39.00 | 37.60 | 55.80 | 57.50 | 58.00 | 53.25 | 43.20 |
| 1921..... | 18.50 | 18.00 | 18.40 | 18.50 | 18.15 | 25.65 | 22.40 | 22.45 | 21.60 | 19.50 |
| 1922..... | 16.90 | 18.00 | 18.50 | 17.90 | 18.50 | 18.20 | 19.25 | 19.00 | 17.30 | 17.30 |
| 1923..... | 19.50 | 19.50 | 19.50 | 20.65 | 21.00 | 16.50 | 16.50 | 16.50 | 16.45 | 16.35 |
| 1924..... | 21.50 | 21.50 | 23.30 | 23.00 | 23.00 | 15.55 | 15.45 | 15.45 | 15.90 | 16.00 |
| 1925..... | 22.00 | 22.10 | 22.60 | 23.50 | 23.25 | 21.75 | 22.40 | 23.05 | 24.75 | 25.00 |
| 1926..... | 20.00 | 20.00 | 20.00 | 21.00 | 21.00 | 26.08 | 27.25 | 27.88 | 28.19 | 28.38 |
| 1927..... | 19.50 | 20.00 | 20.00 | 20.00 | 20.00 | 36.01 | 37.94 | 39.44 | 38.71 | 34.56 |
| 1928..... | 21.50 | 22.00 | 21.50 | 22.00 | 22.00 | 28.35 | 28.06 | 27.80 | 27.70 | 27.00 |
| 1929..... | 26.00 | 26.00 | 26.00 | 26.00 | 26.00 | 34.40 | 34.25 | 35.20 | 35.40 | 34.20 |
| Year | Red clover, Chicago | | | | | Sweet clover, Minneapolis | | | | |
| | Jan. | Feb. | Mar. | Apr. | May | Jan. | Feb. | Mar. | Apr. | May |
| | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 1920..... | 55.20 | 57.00 | 56.30 | 50.25 | 43.20 | 33.30 | 36.25 | 36.50 | 32.25 | 29.00 |
| 1921..... | 21.25 | 18.05 | 20.80 | 19.95 | 18.55 | 10.65 | 10.00 | 10.00 | 9.60 | 9.00 |
| 1922..... | 22.20 | 24.55 | 25.45 | 23.35 | 21.95 | 8.00 | 8.25 | 8.50 | 8.60 | 9.00 |
| 1923..... | 22.55 | 22.45 | 20.60 | 19.70 | 19.35 | 12.40 | 12.00 | 12.40 | 13.00 | 12.25 |
| 1924..... | 23.10 | 21.55 | 21.10 | 19.60 | 19.00 | 15.00 | 15.00 | 15.40 | 15.90 | 15.10 |
| 1925..... | 34.20 | 36.00 | 34.30 | 33.40 | 32.00 | 13.00 | 13.00 | 12.75 | 11.94 | 11.00 |
| 1926..... | 32.17 | 33.50 | 34.69 | 34.00 | 34.00 | 9.00 | 9.46 | 9.80 | 9.98 | 10.00 |
| 1927..... | 38.00 | 42.31 | 45.00 | 44.25 | 42.38 | 14.38 | 14.31 | 14.00 | 13.00 | 12.50 |
| 1928..... | 32.50 | 30.65 | 30.08 | 30.22 | 29.70 | 8.75 | 8.65 | 8.44 | 8.46 | 8.38 |
| 1929..... | 33.00 | 33.40 | 34.60 | 34.40 | 33.20 | 8.50 | 8.50 | 8.50 | 8.50 | 8.50 |
| Year | Kentucky bluegrass, Kansas City | | | | | Timothy, Chicago | | | | |
| | Jan. | Feb. | Mar. | Apr. | May | Jan. | Feb. | Mar. | Apr. | May |
| | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 1920..... | 29.70 | 30.75 | 30.75 | 30.50 | 30.00 | 13.50 | 13.90 | 13.30 | 12.65 | 12.30 |
| 1921..... | 25.50 | 27.00 | 27.75 | 30.60 | 34.00 | 7.10 | 6.50 | 6.40 | 6.40 | 6.45 |
| 1922..... | 50.00 | 52.50 | 55.00 | 55.00 | 55.00 | 7.05 | 7.30 | 7.30 | 6.60 | 6.70 |
| 1923..... | 25.00 | 25.00 | 25.00 | 26.90 | 27.50 | 7.00 | 7.00 | 7.05 | 7.05 | 7.00 |
| 1924..... | 25.10 | 25.40 | 25.00 | 25.00 | 25.00 | 8.15 | 8.25 | 8.10 | 7.75 | 7.55 |
| 1925..... | 28.00 | 28.00 | 28.00 | 28.00 | 28.00 | 6.95 | 6.70 | 6.50 | 6.85 | 7.00 |
| 1926..... | 40.00 | 39.25 | 37.00 | 37.00 | 37.00 | 8.10 | 8.10 | 7.99 | 7.78 | 7.75 |
| 1927..... | 20.25 | 21.00 | 21.00 | 20.25 | 20.00 | 6.08 | 6.08 | 5.86 | 5.98 | 5.98 |
| 1928..... | 19.50 | 19.60 | 19.50 | 20.00 | 20.00 | 4.75 | 4.55 | 4.32 | 4.75 | 5.30 |
| 1929..... | 31.20 | 31.10 | 31.25 | 31.50 | 31.50 | 6.75 | 6.70 | 6.60 | 6.50 | 6.20 |

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high-quality seed.

TABLE 347.—*Seeds: Average price per 100 pounds, specified markets, 1920-1929*

| Year | Alfalfa, Kansas City | Alsike clover, Chicago | Red clover, Chicago | Kentucky bluegrass, Kansas City | Timothy, Chicago | Sweet clover, Minneapolis | Meadow fescue, Kansas City | Lepedeza, Louisville | German millet, Kansas City | Amber sorgho, Kansas City | Hairy vetch, Baltimore | Sudan grass, Kansas City |
|-----------|----------------------|------------------------|---------------------|---------------------------------|------------------|---------------------------|----------------------------|----------------------|----------------------------|---------------------------|------------------------|--------------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1920..... | 40.20 | 53.60 | 52.40 | 30.30 | 13.10 | 33.50 | ----- | 32.90 | ----- | 2.75 | 27.60 | 12.80 |
| 1921..... | 18.30 | 22.30 | 19.70 | 29.00 | 6.60 | 9.80 | ----- | 21.80 | ----- | 1.40 | 9.70 | 3.00 |
| 1922..... | 18.00 | 18.20 | 23.50 | 53.50 | 7.00 | 8.50 | 15.90 | 17.10 | ----- | 2.00 | 12.00 | 4.70 |
| 1923..... | 20.00 | 16.50 | 20.90 | 25.90 | 7.00 | 12.40 | 10.00 | 19.00 | ----- | 4.25 | 16.80 | 15.10 |
| 1924..... | 22.30 | 15.70 | 20.90 | 25.10 | 8.00 | 15.30 | 10.60 | 21.10 | 4.00 | 1.70 | 10.40 | 8.20 |
| 1925..... | 22.70 | 23.40 | 34.00 | 28.00 | 6.80 | 12.30 | 9.40 | ----- | 5.00 | 2.20 | 8.90 | 5.70 |
| 1926..... | 20.40 | 27.60 | 33.79 | 38.00 | 7.90 | 9.70 | 15.50 | 15.20 | 3.10 | 2.80 | 12.30 | 4.20 |
| 1927..... | 19.90 | 37.30 | 42.50 | 20.50 | 6.00 | 13.60 | 25.00 | 8.20 | 3.30 | 3.30 | 15.20 | 7.00 |
| 1928..... | 21.80 | 27.80 | 30.60 | 19.70 | 4.70 | 8.50 | 14.60 | 18.80 | 2.40 | 2.00 | 9.70 | 3.70 |
| 1929..... | 26.00 | 34.70 | 33.70 | 31.30 | 6.60 | 8.50 | 16.00 | 20.60 | 3.40 | 2.10 | 9.30 | 5.00 |

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high-quality seed.

STATISTICS OF MISCELLANEOUS CROPS

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TABLE 348.—*Forage plant seed: Imports into United States, 1916-1929* ¹

| Kind of seed | Year ended June 30 | | | | | | | | | | | | | |
|-------------------------------------|--------------------|---------------|---------------|------------------|---------------|---------------|---------------|------------------|------------------|---------------|------------------|------------------|------------------|------------------|
| | 1916 | 1917 | 1918 | 1919 | 1921 | 1922 | 1923 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| Alfalfa..... | 3,252 | 3,170 | 45 | 770 | 18,831 | 942 | 7,259 | 8,784 | 12,818 | 4,783 | 4,548 | 5,134 | 782 | 1,146 |
| Canada bluegrass..... | 608 | 495 | 1,229 | 739 | 552 | 1,148 | 1,034 | 836 | 817 | 1,150 | 284 | 882 | 1,102 | 1,228 |
| Awnless brome grass..... | (²) | 1 | | | 169 | 9 | 14 | | | | 11 | | (²) | 5 |
| Alsike clover..... | 1,113 | 4,329 | 3,528 | 7,032 | 5,648 | 4,121 | 7,057 | 5,566 | 11,056 | 10,425 | 10,989 | 4,163 | 7,609 | 4,798 |
| Crimson clover..... | 4,504 | 5,776 | 1,603 | 1,484 | 10,053 | 5,566 | 3,443 | 2,262 | 7,745 | 4,834 | 5,766 | 2,385 | 1,346 | 3,395 |
| Red clover..... | 32,509 | 5,344 | 708 | 1,051 | 19,268 | 16,333 | 10,391 | 448 | 24,729 | 6,541 | 19,725 | 10,816 | 4,641 | 7,547 |
| White clover..... | 149 | 158 | 53 | 1 | 189 | 516 | 1,623 | 520 | 1,408 | 1,227 | 1,060 | 975 | 1,778 | 2,410 |
| Biennial white sweet clover..... | (³) | 195 | 71 | 941 | 2,215 | 3,133 | | | 4,039 | 3,493 | 5,879 | 4,130 | 3,370 | 1,464 |
| Biennial yellow sweet clover..... | (³) | 9 | | 1 | 202 | 235 | | | 222 | 52 | 502 | 174 | 116 | 29 |
| Clover mixtures..... | | 26 | 169 | 550 | 265 | 23 | 57 | 20 | 74 | 13 | 122 | 24 | 41 | 250 |
| Grass mixtures..... | | 124 | 6 | (²) | 3 | 6 | 43 | (²) | | 200 | (²) | | | 5 |
| Spring vetch and oats mixtures..... | | | | | | 4 | | | | | | | | |
| Meadow fescue..... | | | | | 3 | | 1 | | (²) | | 13 | 16 | (²) | 8 |
| Broomcorn millet..... | 1,102 | 786 | 1,584 | | 225 | 152 | 1,456 | 5,360 | 595 | 253 | 456 | (¹) | (¹) | (¹) |
| Foxtail millet..... | 118 | 260 | 9 | 138 | 146 | 434 | 302 | 65 | 184 | 243 | 125 | | 30 | 108 |
| Orchard grass..... | 754 | 1,286 | 58 | 177 | 2,771 | | 2,922 | 768 | 603 | 992 | 253 | 260 | 173 | 2,377 |
| Rape..... | 4,019 | 2,286 | 11,316 | 639 | 5,766 | 4,245 | 4,763 | 6,384 | 6,600 | 4,345 | 6,526 | 6,788 | 6,438 | 6,982 |
| Perennial ryegrass..... | 1,510 | 1,668 | 1,584 | 831 | 1,958 | 1,523 | 1,868 | 1,834 | 1,952 | 1,335 | 2,302 | 1,203 | 1,083 | 1,180 |
| Italian ryegrass..... | 383 | 481 | 606 | 208 | 980 | 577 | 828 | 860 | 1,034 | 831 | 1,683 | 833 | 456 | 300 |
| Timothy..... | 119 | 4 | 22 | 155 | 37 | 391 | 95 | 32 | (²) | 1 | 3 | 45 | 23 | (²) |
| Hairy vetch..... | 68 | 296 | 231 | 257 | 1,220 | 1,387 | 1,941 | 1,599 | 3,215 | 2,068 | 3,986 | 2,124 | 3,805 | 4,064 |
| Spring vetch..... | 62 | 30 | 118 | 435 | 1,048 | 542 | 345 | 1,858 | 1,210 | 1,266 | 1,603 | 992 | 563 | 1 |

Bureau of Agricultural Economics. Compiled mainly from data of the Seed Laboratory, Bureau of Plant Industry.

¹ Imports of perennial and Italian ryegrass and hairy vetch up to and including 1917, and sweet clover for all years, are based on information furnished by United States Customs Service. All other figures represent imports of seed permitted entry under the Federal seed act (formerly designated the seed importation act).

² Less than 500 pounds.

³ Figures missing.

⁴ Data not compiled for 1927-1929.

BEEF CATTLE, HOGS, SHEEP, HORSES, AND MULES

TABLE 349.—All cattle and beef cattle; Number and value per head in the United States, 1840, 1850, 1860, 1867–1929

| Year | Cattle on farms | | | Beef cattle on farms and elsewhere, Jan. 1 ⁴ | Year | Cattle on farms | | | Beef cattle on farms and elsewhere, Jan. 1 ⁴ |
|-------------------|-------------------------|----------------------|-------------------------------------|---|-------------------|-------------------------|----------------------|-------------------------------------|---|
| | All cattle ¹ | Other than milk cows | | | | All cattle ¹ | Other than milk cows | | |
| | | Number ² | Value per head, Jan. 1 ³ | | | | Number ² | Value per head, Jan. 1 ³ | |
| | Thousands | Thousands | Dollars | Thousands | | Thousands | Thousands | Dollars | Thousands |
| 1840 ⁵ | 14, 972 | | | | 1898 | 45, 105 | 29, 264 | 20.92 | 38, 000 |
| 1850 ⁵ | 16, 078 | 9, 693 | | 14, 400 | 1899 | 43, 984 | 27, 994 | 22.79 | 37, 100 |
| 1860 ⁵ | 23, 565 | 14, 779 | | 18, 900 | 1900 | 43, 902 | 27, 610 | 23.60 | 34, 170 |
| 1867 | 20, 080 | 11, 731 | 15.79 | 12, 600 | 1900 ⁶ | 67, 720 | 60, 584 | | |
| 1868 | 20, 634 | 11, 942 | 15.06 | 13, 600 | 1900 | 57, 518 | 41, 226 | | |
| 1869 | 21, 433 | 12, 185 | 18.73 | 14, 800 | 1901 | 60, 544 | 43, 710 | 18.83 | 36, 382 |
| 1870 ⁵ | 22, 501 | 13, 566 | | | 1902 | 62, 215 | 45, 518 | 17.73 | 37, 252 |
| 1870 | 25, 484 | 15, 388 | 18.87 | 20, 000 | 1903 | 63, 788 | 46, 677 | 17.44 | 37, 716 |
| 1871 | 26, 235 | 16, 212 | 20.78 | 21, 000 | 1904 | 64, 137 | 46, 717 | 15.42 | 37, 624 |
| 1872 | 26, 604 | 16, 390 | 18.12 | 21, 100 | 1905 | 64, 003 | 46, 431 | 14.32 | 36, 826 |
| 1873 | 26, 900 | 16, 414 | 18.06 | 20, 900 | 1906 | 62, 872 | 43, 078 | 14.98 | 35, 202 |
| 1874 | 26, 923 | 16, 218 | 17.55 | 20, 500 | 1907 | 62, 373 | 41, 405 | 16.16 | 35, 636 |
| 1875 | 27, 220 | 16, 313 | 16.91 | 20, 400 | 1908 | 60, 794 | 39, 600 | 15.96 | 33, 997 |
| 1876 | 27, 870 | 16, 785 | 17.00 | 20, 800 | 1909 | 59, 634 | 37, 914 | 16.53 | 32, 547 |
| 1877 | 29, 217 | 17, 956 | 15.99 | 22, 200 | 1910 ⁵ | 61, 803 | 41, 178 | | |
| 1878 | 30, 523 | 19, 223 | 16.72 | 23, 800 | 1910 | 57, 940 | 37, 315 | 18.02 | 30, 874 |
| 1879 | 33, 234 | 21, 408 | 15.38 | 26, 400 | 1911 | 56, 219 | 35, 396 | 19.41 | 29, 163 |
| 1880 ⁵ | 34, 982 | 22, 489 | | | 1912 | 55, 022 | 34, 323 | 20.03 | 27, 622 |
| 1880 | 33, 258 | 21, 231 | 16.10 | 25, 900 | 1913 | 55, 833 | 35, 336 | 24.91 | 27, 806 |
| 1881 | 33, 308 | 20, 939 | 17.33 | 24, 900 | 1914 | 58, 737 | 38, 000 | 29.42 | 29, 039 |
| 1882 | 35, 892 | 23, 280 | 19.89 | 27, 600 | 1915 | 62, 532 | 41, 270 | 31.54 | 31, 177 |
| 1883 | 41, 172 | 28, 046 | 21.81 | 33, 400 | 1916 | 66, 304 | 44, 286 | 31.69 | 33, 953 |
| 1884 | 42, 547 | 29, 046 | 23.52 | 31, 100 | 1917 | 69, 533 | 46, 639 | 33.91 | 36, 059 |
| 1885 | 43, 772 | 29, 867 | 23.25 | 34, 400 | 1918 | 71, 229 | 47, 919 | 38.63 | 38, 076 |
| 1886 | 45, 510 | 31, 275 | 21.17 | 35, 700 | 1919 | 70, 261 | 46, 786 | 41.79 | 38, 056 |
| 1887 | 48, 034 | 33, 512 | 19.79 | 37, 900 | 1920 ⁵ | 66, 639 | 46, 854 | | |
| 1888 | 49, 234 | 31, 378 | 17.79 | 38, 300 | 1920 | 68, 871 | 47, 444 | 29.93 | 36, 995 |
| 1889 | 50, 331 | 35, 032 | 17.05 | 38, 300 | 1921 | 67, 184 | 45, 776 | 28.92 | 35, 629 |
| 1890 ⁵ | 60, 246 | 35, 734 | | | 1922 | 67, 264 | 45, 476 | 21.87 | 35, 335 |
| 1890 | 52, 802 | 36, 849 | 15.21 | 39, 800 | 1923 | 66, 156 | 44, 093 | 23.44 | 33, 718 |
| 1891 | 52, 896 | 36, 876 | 14.76 | 40, 900 | 1924 | 64, 507 | 42, 252 | 23.07 | 31, 779 |
| 1892 | 54, 067 | 37, 651 | 15.16 | 42, 000 | 1925 ⁵ | 60, 760 | 42, 115 | | |
| 1893 | 52, 378 | 35, 954 | 15.24 | 40, 500 | 1925 | 61, 906 | 39, 515 | 22.58 | 28, 711 |
| 1894 | 53, 095 | 36, 608 | 14.66 | 43, 700 | 1926 | 59, 122 | 36, 034 | 26.42 | 26, 608 |
| 1895 | 50, 869 | 34, 364 | 14.06 | 41, 700 | 1927 | 56, 832 | 35, 031 | 28.28 | 24, 585 |
| 1896 | 48, 223 | 32, 085 | 15.86 | 39, 700 | 1928 | 55, 681 | 33, 857 | 36.38 | 23, 915 |
| 1897 | 46, 450 | 30, 508 | 16.65 | 38, 700 | 1929 | 55, 751 | 33, 931 | 43.12 | 23, 810 |

Bureau of Agricultural Economics. Later, revised figures for 1923, 1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Prior to 1900 estimates for each 10-year period represent an index of annual changes applied to census as base on first report after census data were available. Figures 1900–1919 are tentative revised estimates of the Bureau of Agricultural Economics as first published in 1927 Yearbook.

² Obtained by subtracting the estimates of "milk cows on farms" shown in Table 438 from the estimates of "all cattle on farms" shown in this table.

³ Series for 1867–1899 are estimates as currently reported. Data for 1900–1925 are an old series adjusted on basis average relationship between the old and new series from 1926 to 1928. Old series was weighted averages of prices by age group; only and was shown in 1928 Yearbook. The conversion factor was .9466 (base is old series). Data for 1926–1929 are a new series, referred to above, of average values by age and sex classification weighted by numbers in each class.

⁴ Data for beef cattle on farms and elsewhere as of Jan. 1 estimated by the Bureau of Animal Industry. Prior to 1920 census figures were adjusted to a January 1 basis and to include all ages and all animals in towns villages and ranges, as well as on farms. For methods, see Department Circular 241. Revisions have been made by the Bureau of Animal Industry for 1900–1929 in line with revision of estimates of cattle on farms.

⁵ Italic figures for census years represent classification of cattle as follows: 1840 reported as "neat cattle," 1880 and 1890 exclude an estimated number of unenumerated cattle on ranges as follows: 1880, 3,750,022; 1890, 6,285,220. No estimate made prior to 1880. Figures for censuses prior to 1900 were nominally exclusive of calves, though some calves may have been included. 1900, 1910, and 1920 include calves. 1850–1890 exclude working oxen as follows: 1850, 1,700,744; 1890, 2,254,911; 1870, 1,319,371; 1880, 963,841; 1890, 1,117,494. Not separately reported after 1890. Census dates were June 1 from 1840 to 1900; April 15, 1910; January 1, 1920 and 1925.

⁶ Original estimate of the Bureau of Agricultural Economics.

⁷ Preliminary.

TABLE 350.—All cattle and calves, including cows and heifers kept for milk: Estimated number on farms and value per head, by States, January 1, 1925-1929

| State and division | Number | | | | | Value per head ¹ | | | | |
|---------------------|----------------|----------------|----------------|----------------|-------------------|-----------------------------|---------|---------|---------|-------------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 ² | 1925 | 1926 | 1927 | 1928 | 1929 ² |
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Dollars | Dollars | Dollars | Dollars | Dollars |
| Maine..... | 241 | 235 | 233 | 224 | 228 | 40.70 | 50.40 | 51.20 | 57.80 | 66.60 |
| New Hampshire..... | 125 | 119 | 113 | 112 | 115 | 45.70 | 56.90 | 64.10 | 79.30 | 88.70 |
| Vermont..... | 403 | 401 | 403 | 412 | 422 | 44.10 | 53.80 | 60.70 | 76.70 | 78.60 |
| Massachusetts..... | 195 | 187 | 181 | 181 | 183 | 62.40 | 71.50 | 81.60 | 102.80 | 106.90 |
| Rhode Island..... | 27 | 27 | 27 | 27 | 28 | 71.00 | 76.50 | 80.30 | 109.30 | 118.50 |
| Connecticut..... | 100 | 151 | 144 | 142 | 144 | 64.00 | 74.20 | 82.70 | 109.90 | 118.30 |
| New York..... | 1,852 | 1,824 | 1,808 | 1,865 | 1,895 | 52.10 | 66.70 | 74.20 | 90.60 | 100.40 |
| New Jersey..... | 164 | 154 | 157 | 161 | 163 | 64.80 | 81.40 | 87.90 | 102.10 | 114.20 |
| Pennsylvania..... | 1,318 | 1,298 | 1,289 | 1,332 | 1,372 | 48.30 | 58.40 | 60.70 | 77.10 | 86.90 |
| North Atlantic..... | 4,475 | 4,396 | 4,355 | 4,456 | 4,550 | 50.89 | 62.99 | 68.63 | 85.00 | 93.76 |
| Ohio..... | 1,675 | 1,616 | 1,608 | 1,621 | 1,640 | 43.50 | 49.20 | 52.50 | 61.80 | 71.30 |
| Indiana..... | 1,282 | 1,282 | 1,320 | 1,291 | 1,307 | 42.50 | 46.60 | 48.90 | 59.00 | 67.00 |
| Illinois..... | 2,345 | 2,251 | 2,161 | 1,967 | 1,967 | 41.80 | 48.20 | 50.00 | 59.30 | 69.00 |
| Michigan..... | 1,406 | 1,420 | 1,406 | 1,406 | 1,406 | 45.20 | 49.90 | 54.00 | 66.50 | 77.00 |
| Wisconsin..... | 3,035 | 3,035 | 2,960 | 2,920 | 2,892 | 42.60 | 53.20 | 57.20 | 69.90 | 79.20 |
| Minnesota..... | 2,853 | 2,853 | 2,710 | 2,710 | 2,737 | 35.70 | 42.20 | 43.00 | 54.40 | 63.40 |
| Iowa..... | 4,372 | 4,241 | 4,029 | 3,720 | 3,845 | 37.50 | 42.40 | 44.00 | 54.20 | 61.90 |
| Missouri..... | 2,442 | 2,369 | 2,174 | 2,109 | 2,109 | 30.70 | 33.20 | 37.40 | 47.60 | 57.80 |
| North Dakota..... | 1,341 | 1,290 | 1,100 | 1,067 | 1,078 | 27.30 | 30.80 | 33.30 | 43.70 | 53.80 |
| South Dakota..... | 2,074 | 1,919 | 1,635 | 1,570 | 1,570 | 29.30 | 33.20 | 35.50 | 47.90 | 55.90 |
| Nebraska..... | 3,314 | 3,191 | 2,819 | 2,766 | 2,766 | 31.40 | 35.80 | 37.00 | 49.40 | 59.30 |
| Kansas..... | 3,068 | 2,853 | 2,568 | 2,696 | 2,831 | 29.50 | 34.10 | 35.70 | 45.20 | 53.70 |
| North Central..... | 29,207 | 28,260 | 26,490 | 25,849 | 26,118 | 35.98 | 41.17 | 44.10 | 55.13 | 63.95 |
| Delaware..... | 46 | 48 | 48 | 49 | 50 | 50.00 | 53.60 | 60.30 | 77.60 | 93.70 |
| Maryland..... | 273 | 270 | 265 | 275 | 283 | 48.30 | 54.30 | 54.70 | 69.90 | 79.50 |
| Virginia..... | 827 | 744 | 707 | 720 | 765 | 31.20 | 32.40 | 35.00 | 47.10 | 54.80 |
| West Virginia..... | 591 | 526 | 473 | 482 | 496 | 30.90 | 33.30 | 36.30 | 52.00 | 60.40 |
| North Carolina..... | 545 | 523 | 486 | 496 | 506 | 28.50 | 30.00 | 31.80 | 44.70 | 48.30 |
| South Carolina..... | 341 | 300 | 280 | 275 | 272 | 24.30 | 23.90 | 28.40 | 31.10 | 38.90 |
| Georgia..... | 938 | 854 | 854 | 837 | 820 | 17.30 | 19.10 | 20.50 | 27.00 | 31.10 |
| Florida..... | 656 | 630 | 592 | 533 | 480 | 16.50 | 17.50 | 17.00 | 17.60 | 23.40 |
| South Atlantic..... | 4,217 | 3,895 | 3,705 | 3,676 | 3,672 | 26.18 | 28.00 | 30.15 | 39.70 | 46.52 |
| Kentucky..... | 938 | 910 | 910 | 955 | 955 | 26.80 | 30.60 | 35.40 | 46.90 | 52.00 |
| Tennessee..... | 1,023 | 921 | 912 | 958 | 977 | 20.80 | 23.70 | 28.50 | 38.90 | 43.60 |
| Alabama..... | 840 | 739 | 746 | 709 | 702 | 16.10 | 17.70 | 20.50 | 27.80 | 32.40 |
| Mississippi..... | 938 | 845 | 853 | 879 | 835 | 14.20 | 18.20 | 18.90 | 25.80 | 30.10 |
| Arkansas..... | 837 | 795 | 795 | 772 | 772 | 15.20 | 17.90 | 20.60 | 29.90 | 34.20 |
| Louisiana..... | 720 | 648 | 616 | 579 | 585 | 17.80 | 19.20 | 20.70 | 23.70 | 31.90 |
| Oklahoma..... | 1,695 | 1,610 | 1,723 | 1,723 | 1,723 | 21.10 | 25.40 | 30.90 | 39.70 | 45.20 |
| Texas..... | 6,275 | 5,900 | 5,841 | 5,607 | 5,607 | 20.60 | 21.40 | 27.20 | 37.60 | 42.20 |
| South Central..... | 13,266 | 12,368 | 12,306 | 12,182 | 12,156 | 19.89 | 21.98 | 26.68 | 36.16 | 41.12 |
| Montana..... | 1,340 | 1,280 | 1,114 | 1,114 | 1,103 | 28.70 | 31.10 | 33.00 | 46.00 | 57.90 |
| Idaho..... | 650 | 624 | 605 | 588 | 570 | 28.50 | 36.90 | 41.00 | 48.60 | 57.20 |
| Wyoming..... | 795 | 787 | 771 | 764 | 764 | 27.90 | 34.40 | 37.60 | 49.00 | 62.10 |
| Colorado..... | 1,465 | 1,377 | 1,418 | 1,317 | 1,317 | 26.00 | 32.00 | 36.20 | 46.70 | 55.30 |
| New Mexico..... | 1,290 | 1,213 | 1,189 | 1,070 | 1,017 | 21.50 | 27.00 | 29.20 | 38.90 | 46.50 |
| Arizona..... | 1,069 | 863 | 794 | 675 | 540 | 24.30 | 31.50 | 32.70 | 40.00 | 49.80 |
| Utah..... | 507 | 482 | 472 | 460 | 460 | 26.40 | 35.90 | 37.30 | 45.60 | 57.50 |
| Nevada..... | 419 | 385 | 350 | 332 | 315 | 24.10 | 36.20 | 35.80 | 46.40 | 59.80 |
| Washington..... | 582 | 558 | 530 | 530 | 541 | 43.70 | 44.40 | 60.00 | 58.20 | 72.40 |
| Oregon..... | 796 | 716 | 687 | 673 | 673 | 34.40 | 38.60 | 40.00 | 49.50 | 60.10 |
| California..... | 1,918 | 1,918 | 1,956 | 1,995 | 1,955 | 41.90 | 46.80 | 47.70 | 53.70 | 64.50 |
| Far Western..... | 10,831 | 10,203 | 9,886 | 9,518 | 9,255 | 30.25 | 35.98 | 38.44 | 47.79 | 58.49 |
| United States..... | 61,996 | 59,122 | 56,832 | 55,681 | 55,751 | 31.95 | 37.16 | 40.29 | 51.10 | 59.35 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board. Later revised figures for 1928, 1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Sum of total value of subgroups (classified by age and sex), divided by total number and rounded to nearest dime for States. Division and United States averages not rounded. State figures are new weighted value series not comparable to State figures previously published.

² Preliminary.

TABLE 351.—Cattle: Number in countries having 150,000 or over, average 1909–1913 and 1921–1925, annual 1926–1929

| Country | Month of estimate | Average 1909–1913 ¹ | Average 1921–1925 ¹ | 1926 | 1927 | 1928 | 1929 |
|--|-----------------------|-----------------------------------|-----------------------------------|------------------------|------------------------|------------------------|------------------------|
| NORTH AMERICA AND WEST INDIES | | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> |
| Canada..... | June..... | 6,551 | 9,588 | 8,571 | 9,172 | 8,793 | 8,931 |
| United States..... | January..... | 56,750 | 65,421 | 59,122 | 56,832 | 55,676 | 56,467 |
| Mexico..... | June..... | ² 5,112 | ⁴ 2,492 | 5,585 | | | |
| Guatemala..... | July..... | 557 | 208 | 504 | 310 | 298 | |
| Honduras..... | | 411 | ⁴ 466 | | | | |
| Salvador..... | | 350 | | | | | |
| Nicaragua..... | | ³ 252 | ⁶ 1,200 | | | | |
| Costa Rica..... | | 333 | 435 | 423 | 478 | 403 | |
| Cuba..... | December ⁷ | 2,917 | 4,841 | 3,783 | | 4,584 | |
| Dominican Republic | May..... | | 640 | | | | |
| Porto Rico..... | | ³ 316 | 279 | | | | |
| Estimated total ⁸ | | 74,900 | \$6,600 | | | | |
| SOUTH AMERICA | | | | | | | |
| Colombia..... | | 4,000 | 7,468 | 6,500 | 6,727 | | |
| Venezuela..... | | 2,004 | 2,689 | | | | |
| Ecuador..... | | | ⁹ 1,500 | 1,280 | | | ⁹ 1,285 |
| Peru..... | February..... | | 1,198 | | | | |
| Bolivia..... | | 734 | 2,145 | 2,320 | | | |
| Chile..... | | 1,780 | 1,957 | | | | |
| Brazil ¹⁰ | September..... | 30,705 | ¹¹ 34,271 | | | | |
| Uruguay..... | | ⁸ 8,193 | ³ 8,432 | | | | ⁹ 9,153 |
| Paraguay..... | December ⁷ | 4,422 | 4,600 | | | | |
| Argentina..... | do. ⁷ | ¹² 25,867 | ³ 37,065 | | | | ² 34,410 |
| Estimated total ⁸ | | 80,300 | 101,500 | | | | |
| EUROPE | | | | | | | |
| England and Wales..... | June..... | 5,843 | 5,821 | 6,253 | 6,275 | 6,026 | 5,956 |
| Isle of Man..... | do..... | 21 | 19 | 19 | 19 | 19 | |
| Scotland..... | do..... | 1,203 | 1,171 | 1,198 | 1,210 | 1,214 | 1,224 |
| Northern Ireland..... | do..... | 786 | 748 | 667 | 697 | 738 | 700 |
| Irish Free State..... | do..... | 4,061 | 4,266 | 3,947 | 4,047 | 4,125 | 4,137 |
| Norway ¹³ | do..... | ¹⁴ 1,134 | 1,128 | 1,200 | 1,209 | 1,221 | |
| Sweden..... | do..... | 3,060 | 2,418 | | 2,898 | | |
| Denmark..... | July..... | 2,717 | 2,613 | 2,838 | 2,913 | 3,016 | 3,031 |
| Holland..... | May–June..... | ³ 2,062 | ³ 2,063 | | | | |
| Belgium..... | December ⁷ | 1,925 | 1,550 | 1,655 | 1,712 | 1,739 | 1,751 |
| France..... | do. ⁷ | 15,338 | 13,582 | 14,373 | 14,482 | 14,941 | 15,005 |
| Spain..... | do. ⁷ | 2,587 | 3,457 | 3,794 | 3,688 | | |
| Portugal..... | | ¹⁵ 703 | 754 | | | | |
| Italy ¹⁰ | March–April..... | 6,590 | 6,812 | ⁷ 7,400 | | | |
| Switzerland..... | April..... | ⁸ 1,443 | ³ 1,425 | 1,587 | | | |
| Germany..... | December ⁷ | 18,474 | 16,786 | 17,202 | 17,221 | 18,011 | 18,390 |
| Austria..... | December–April..... | 2,356 | 2,241 | | | | ² 2,330 |
| Czechoslovakia..... | December ⁷ | 4,598 | 4,377 | 4,690 | | | |
| Hungary..... | April..... | 2,150 | 1,866 | 1,847 | 1,805 | 1,812 | 1,819 |
| Yugoslavia ¹⁰ | January..... | 5,155 | 4,122 | 3,738 | 3,760 | 3,686 | |
| Greece ¹⁰ | December ⁷ | 665 | 742 | 890 | 864 | 947 | 955 |
| Bulgaria ¹⁰ | do. ⁷ | 2,048 | 1,928 | | 2,266 | | |
| Rumania ¹⁰ | do. ⁷ | 5,648 | 5,570 | 5,219 | 4,992 | 4,744 | 4,625 |
| Poland..... | November..... | 8,664 | 8,063 | | 8,602 | | |
| Lithuania..... | | 918 | 1,149 | 1,396 | 1,128 | 1,199 | |
| Latvia..... | June..... | 912 | 867 | 955 | 967 | 961 | ⁹ 975 |
| Estonia..... | July..... | 528 | 508 | 599 | 634 | 651 | 606 |
| Finland..... | September..... | 1,605 | 1,847 | 1,860 | 1,872 | 1,917 | |
| Russia, European and Asiatic ¹⁶ | Summer..... | ¹⁷ 60,280 | 57,278 | 63,025 | 65,952 | 69,066 | 66,993 |
| Estimated total, ex- cluding Russia. ⁸ | | 103,300 | 98,000 | | | | |
| AFRICA | | | | | | | |
| Morocco..... | | ¹⁸ 675 | 1,711 | 1,933 | 1,865 | 1,816 | |
| Algeria..... | September..... | 1,112 | 853 | 946 | 849 | 887 | |
| Tunis..... | December ⁷ | 195 | 469 | 370 | 468 | 501 | |
| French West Africa..... | | | 2,165 | 2,329 | 2,402 | 2,441 | |
| French Sudan..... | | | 1,086 | 910 | 1,030 | 909 | |
| Nigeria..... | | | 2,805 | 3,162 | 2,997 | 3,073 | |
| French Cameroen..... | | | 354 | 332 | 342 | 400 | |
| Egypt ¹⁰ | September..... | 1,316 | 1,310 | 1,485 | 1,497 | 1,580 | |
| Anglo-Egyptian Sudan..... | | | 864 | 1,500 | 1,501 | 1,803 | |
| Italian Somaliland..... | February..... | | ¹¹ 1,246 | | | 1,106 | 1,112 |
| Eritrea..... | | 517 | 553 | | 748 | | |
| Kenya Colony..... | March–June..... | 754 | 3,088 | 3,413 | 3,476 | 3,482 | |
| Uganda..... | December ⁷ | 556 | 1,109 | 1,342 | 1,338 | 1,733 | 1,710 |
| French Equatorial Africa..... | | | 815 | 881 | | | |
| Belgian Congo..... | | | 495 | 405 | 495 | 485 | |
| Ruanda–Urundi..... | | 500 | 700 | 750 | 771 | 950 | |
| Portuguese East Africa..... | | | 341 | 380 | 425 | 437 | |

See footnotes at end of table.

TABLE 351.—*Cattle: Number in countries having 150,000 or over, average 1909–1913 and 1921–1925, annual 1926–1929—Continued*

| Country | Month of estimate | Average 1909–1913 ¹ | Average 1921–1925 ¹ | 1926 | 1927 | 1928 | 1929 |
|--|-----------------------|-----------------------------------|-----------------------------------|----------------|----------------|----------------------|----------------|
| AFRICA—continued | | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| British Southwest Africa | | 206 | 561 | 621 | 685 | | |
| Bechuanaland | | ² 324 | 482 | 518 | 598 | | |
| Union of South Africa | April–May | ³ 5,797 | 9,459 | 10,514 | 10,590 | ¹⁰ 10,655 | |
| Basutoland | | ² 437 | 604 | 645 | 659 | 650 | |
| Rhodesia: | | | | | | | |
| Northern | December ⁷ | 255 | 289 | 382 | 363 | 416 | 441 |
| Southern | do. ⁷ | 509 | 1,794 | 2,102 | 2,189 | 2,327 | 2,326 |
| Swaziland | | 60 | 232 | 300 | 350 | | |
| Tanganyika Territory | | 2,095 | 3,806 | 4,479 | 4,706 | 4,895 | |
| Madagascar | February | 4,890 | 7,708 | | 7,362 | 6,901 | |
| Estimated total ⁸ | | 30,700 | 46,500 | | | | |
| ASIA | | | | | | | |
| Turkey, European and Asiatic. ²⁰ | | 6,438 | 4,265 | 5,916 | 6,934 | | |
| Persia | | | ⁹ 1,000 | | | | |
| Syria and Lebanon | | | 257 | 243 | 220 | | |
| India: ¹⁰ | | | | | | | |
| British | December–April | 128,451 | 146,759 | 150,832 | 151,288 | 151,156 | |
| Native States | do. | 13,258 | 33,982 | 33,276 | 34,544 | | |
| Ceylon ¹⁰ | December ⁷ | 1,484 | 1,459 | 1,457 | 1,537 | 1,588 | 1,618 |
| China (Includes Turkestan and Manchuria). | | 21,997 | | | | | |
| Japan | December ⁷ | 1,385 | 1,440 | 1,460 | 1,465 | 1,474 | |
| Chosen ¹⁰ | do. | 966 | 1,567 | 1,591 | 1,595 | 1,586 | 1,570 |
| Formosa ¹⁰ | do. | 473 | 407 | 379 | 381 | 386 | 388 |
| French-Indo China ¹⁰ | | ¹⁷ 4,616 | 3,474 | | | | |
| Siam ¹⁰ | March | 4,501 | 6,701 | 8,230 | 8,495 | 8,657 | |
| Philippine Islands ¹⁰ | December ⁷ | 1,190 | 2,393 | 2,622 | 2,846 | 3,089 | |
| Dutch East Indies: | | | | | | | |
| Java and Madura ¹⁰ | do. | 5,091 | 5,287 | 5,721 | 5,680 | 5,781 | |
| Outer possessions ¹⁰ | do. | 1,640 | 1,872 | 1,965 | 1,952 | 1,983 | |
| Estimated total, excluding Russia. ⁸ | | 195,100 | 235,000 | | | | |
| OCEANIA | | | | | | | |
| Australia | December ⁷ | 11,535 | 13,789 | 13,280 | 11,963 | 11,617 | |
| New Zealand | January | ² 2,020 | 3,393 | 3,452 | 3,258 | 3,274 | 3,446 |
| Estimated total ⁸ | | 13,800 | 17,400 | | | | |
| Total countries reporting all periods, including Russia: | | | | | | | |
| Pre-war to 1928 (47) ²¹ | | 365,815 | 407,824 | 417,144 | 418,204 | 421,847 | |
| Pre-war to 1929 (23) ²¹ | | 190,104 | 198,398 | 199,066 | 200,536 | 203,770 | 202,761 |
| Estimated world total, including Russia. ⁴ | | 558,400 | 642,300 | | | | |

Bureau of Agricultural Economics. Compiled from official sources and the International Institute of Agriculture unless otherwise stated.

¹ Average for 5-year period if available, otherwise for any year or years within this period except as otherwise stated. In countries, having changed boundaries, the pre-war figures are estimates for 1 year only of numbers within present boundaries. For the pre-war average the years immediately preceding the war have been used.

² Year 1902.

³ Census.

⁴ Incomplete.

⁵ Year 1918.

⁶ Year 1908.

⁷ Estimates reported as of December have been considered as of Jan. 1 of the following year, i. e., figures for number of cattle in France as of Dec. 31, 1925, have been put in the 1926 column.

⁸ This total includes interpolations for a few countries not reporting each year and rough estimates for some others.

⁹ Unofficial.

¹⁰ Buffaloes included.

¹¹ Year 1920.

¹² June, 1914.

¹³ In rural communities only.

¹⁴ September.

¹⁵ Year 1906.

¹⁶ Years 1916, 1923–1927 from Soviet Union Review, April, 1928. Years 1928 and 1929, Economic Life, Aug. 14, 1929, quoting Central Statistical Bureau.

¹⁷ Year 1916.

¹⁸ Year 1915.

¹⁹ Number in towns assumed to be same as in 1927, i. e., 177,000 and added in for purposes of comparison with preceding years.

²⁰ In addition there were 832,163 buffaloes in pre-war times, 552,596 in 1926 and 794,595 in 1927.

²¹ Comparable totals for number of countries indicated.

TABLE 352.—*Cattle and calves: Receipts at principal public stockyards and at all public stockyards, 1909–1929*

| Year | Chi- cago | Den- ver | East St. Louis | Fort Worth | Kansas City | Oma- ha | St. Jo- seph | South St. Paul | Sioux City | Total 9 mar- kets ¹ | All other stock- yards report- ing ² | Total all stock- yards report- ing ² |
|-----------|----------------|----------------|----------------------|----------------|----------------|----------------|--------------------|----------------------|----------------|--------------------------------------|--|--|
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| 1909..... | 3,340 | 426 | 1,241 | 1,197 | 2,660 | 1,125 | 592 | 497 | 426 | 11,504 | | |
| 1910..... | 3,553 | 399 | 1,208 | 1,071 | 2,507 | 1,224 | 565 | 604 | 439 | 11,570 | | |
| 1911..... | 3,453 | 298 | 1,072 | 884 | 2,370 | 1,174 | 513 | 539 | 487 | 10,790 | | |
| 1912..... | 3,158 | 416 | 1,200 | 1,039 | 2,147 | 1,017 | 494 | 524 | 431 | 10,426 | | |
| 1913..... | 2,888 | 499 | 1,100 | 1,185 | 2,319 | 962 | 450 | 532 | 394 | 10,329 | | |
| 1914..... | 2,601 | 443 | 1,041 | 1,176 | 1,957 | 939 | 356 | 585 | 368 | 9,466 | | |
| 1915..... | 2,685 | 424 | 992 | 944 | 1,963 | 1,218 | 441 | 856 | 534 | 10,057 | 4,496 | 14,553 |
| 1916..... | 3,250 | 601 | 1,200 | 1,081 | 2,331 | 1,434 | 490 | 941 | 602 | 11,920 | 5,756 | 17,676 |
| 1917..... | 3,820 | 653 | 1,405 | 1,960 | 2,902 | 1,720 | 670 | 1,197 | 707 | 15,034 | 8,032 | 23,066 |
| 1918..... | 4,448 | 728 | 1,509 | 1,665 | 3,320 | 1,993 | 870 | 1,430 | 818 | 16,781 | 8,514 | 25,295 |
| 1919..... | 4,253 | 824 | 1,473 | 1,267 | 3,085 | 1,975 | 750 | 1,491 | 814 | 15,932 | 8,697 | 24,629 |
| 1920..... | 3,849 | 617 | 1,254 | 1,134 | 2,500 | 1,603 | 643 | 1,373 | 752 | 13,725 | 8,472 | 22,197 |
| 1921..... | 3,540 | 482 | 1,077 | 984 | 2,469 | 1,435 | 558 | 965 | 620 | 12,150 | 7,637 | 19,787 |
| 1922..... | 3,934 | 656 | 1,400 | 1,084 | 2,883 | 1,744 | 655 | 1,367 | 747 | 14,590 | 8,628 | 23,218 |
| 1923..... | 3,918 | 620 | 1,399 | 1,278 | 3,208 | 1,793 | 709 | 1,349 | 759 | 15,013 | 8,198 | 23,211 |
| 1924..... | 3,997 | 630 | 1,385 | 1,332 | 3,043 | 1,963 | 720 | 1,323 | 836 | 15,189 | 8,506 | 23,695 |
| 1925..... | 3,871 | 587 | 1,444 | 1,370 | 2,958 | 1,709 | 734 | 1,636 | 897 | 15,206 | 8,861 | 24,067 |
| 1926..... | 4,012 | 529 | 1,526 | 1,185 | 2,617 | 1,815 | 679 | 1,910 | 969 | 15,242 | 8,630 | 23,872 |
| 1927..... | 3,583 | 640 | 1,448 | 1,286 | 2,479 | 1,561 | 641 | 1,582 | 809 | 14,020 | 8,743 | 22,763 |
| 1928..... | 3,297 | 667 | 1,315 | 1,211 | 2,210 | 1,518 | 598 | 1,490 | 813 | 13,089 | 8,389 | 21,478 |
| 1929..... | 3,060 | 624 | 1,223 | 1,089 | 2,178 | 1,546 | 590 | 1,425 | 839 | 12,574 | 7,866 | 20,440 |

Bureau of Agricultural Economics. Prior to 1915 figures compiled from yearbooks of stockyard companies; subsequent figures compiled from data of the livestock and meat reporting service of the bureau. Receipts 1900–1908 are available in 1924 Yearbook, p. 840, Table 435.

¹ Total of the rounded detail figures.

² Totals for all stockyards not available prior to 1915.

TABLE 353.—*Cattle and calves: Receipts and stocker and feeder shipments at all public stockyards, 1915–1929*

RECEIPTS, CATTLE

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| 1915..... | 906 | 664 | 849 | 766 | 875 | 897 | 858 | 1,083 | 1,355 | 1,630 | 1,535 | 1,024 | 12,442 |
| 1916..... | 1,043 | 892 | 976 | 862 | 1,078 | 1,051 | 948 | 1,346 | 1,548 | 2,134 | 1,716 | 1,257 | 14,851 |
| 1917..... | 1,456 | 1,092 | 1,069 | 1,205 | 1,581 | 1,454 | 1,415 | 1,513 | 2,044 | 2,657 | 2,308 | 1,670 | 19,464 |
| 1918..... | 1,500 | 1,284 | 1,408 | 1,634 | 1,432 | 1,450 | 1,730 | 1,697 | 2,411 | 2,484 | 2,340 | 1,871 | 21,241 |
| 1919..... | 1,795 | 1,208 | 1,179 | 1,318 | 1,382 | 1,195 | 1,511 | 1,618 | 1,978 | 2,526 | 2,263 | 1,816 | 19,819 |
| 1920..... | 1,514 | 1,147 | 1,207 | 1,090 | 1,303 | 1,343 | 1,203 | 1,458 | 1,789 | 1,744 | 1,978 | 1,064 | 16,860 |
| 1921..... | 1,256 | 871 | 1,114 | 1,043 | 1,065 | 1,095 | 893 | 1,375 | 1,361 | 1,754 | 1,447 | 1,036 | 14,310 |
| 1922..... | 1,222 | 1,044 | 1,145 | 1,009 | 1,358 | 1,217 | 1,255 | 1,608 | 1,802 | 2,243 | 1,846 | 1,392 | 17,141 |
| 1923..... | 1,395 | 1,038 | 1,044 | 1,159 | 1,305 | 1,138 | 1,357 | 1,622 | 1,782 | 2,141 | 1,650 | 1,368 | 16,999 |
| 1924..... | 1,388 | 1,041 | 1,084 | 1,161 | 1,317 | 1,172 | 1,254 | 1,395 | 1,938 | 2,096 | 1,796 | 1,528 | 17,173 |
| 1925..... | 1,353 | 1,056 | 1,273 | 1,201 | 1,139 | 1,160 | 1,398 | 1,632 | 1,592 | 2,126 | 1,717 | 1,470 | 17,117 |
| 1926..... | 1,314 | 1,065 | 1,233 | 1,146 | 1,277 | 1,279 | 1,421 | 1,827 | 2,030 | 1,836 | 1,327 | 1,031 | 17,031 |
| 1927..... | 1,327 | 1,080 | 1,172 | 1,107 | 1,348 | 1,185 | 1,089 | 1,494 | 1,482 | 2,008 | 1,749 | 1,217 | 16,268 |
| 1928..... | 1,272 | 1,045 | 966 | 1,119 | 1,188 | 1,057 | 1,158 | 1,308 | 1,669 | 1,913 | 1,419 | 1,075 | 15,189 |
| 1929..... | 1,160 | 814 | 953 | 1,146 | 1,097 | 977 | 1,168 | 1,156 | 1,572 | 1,787 | 1,405 | 1,104 | 14,337 |

TABLE 353.—*Cattle and calves: Receipts and stocker and feeder shipments at all public stockyards, 1915-1929—Continued*

RECEIPTS, CALVES

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| 1915 | 123 | 103 | 168 | 221 | 236 | 216 | 181 | 164 | 176 | 188 | 189 | 146 | 2,111 |
| 1916 | 159 | 162 | 225 | 289 | 307 | 269 | 206 | 238 | 230 | 275 | 261 | 203 | 2,824 |
| 1917 | 240 | 210 | 260 | 335 | 381 | 305 | 313 | 302 | 313 | 397 | 317 | 229 | 3,602 |
| 1918 | 228 | 214 | 305 | 411 | 431 | 365 | 398 | 327 | 415 | 381 | 308 | 271 | 4,054 |
| 1919 | 325 | 245 | 337 | 455 | 454 | 392 | 505 | 421 | 418 | 482 | 410 | 366 | 4,810 |
| 1920 | 366 | 333 | 456 | 467 | 475 | 536 | 467 | 504 | 506 | 466 | 450 | 311 | 5,377 |
| 1921 | 388 | 319 | 452 | 450 | 477 | 485 | 451* | 492 | 545 | 557 | 481 | 380 | 5,477 |
| 1922 | 406 | 372 | 477 | 461 | 520 | 542 | 456 | 541 | 595 | 693 | 581 | 433 | 6,077 |
| 1923 | 482 | 389 | 458 | 511 | 595 | 492 | 546 | 592 | 512 | 661 | 532 | 442 | 6,212 |
| 1924 | 500 | 415 | 472 | 590 | 574 | 502 | 544 | 536 | 628 | 640 | 567 | 555 | 6,523 |
| 1925 | 516 | 473 | 588 | 626 | 597 | 586 | 572 | 612 | 566 | 663 | 565 | 519 | 6,950 |
| 1926 | 526 | 486 | 578 | 604 | 616 | 592 | 541 | 576 | 570 | 644 | 625 | 473 | 6,337 |
| 1927 | 504 | 476 | 571 | 567 | 607 | 547 | 457 | 571 | 507 | 627 | 598 | 435 | 6,505 |
| 1928 | 499 | 471 | 499 | 506 | 610 | 501 | 492 | 521 | 522 | 629 | 544 | 435 | 6,289 |
| 1929 | 479 | 381 | 497 | 606 | 563 | 475 | 499 | 463 | 531 | 620 | 538 | 451 | 6,103 |

STOCKER AND FEEDER SHIPMENTS, CATTLE

| | | | | | | | | | | | | | |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 1915 | 144 | 81 | 129 | 139 | 91 | 73 | 86 | 164 | 349 | 440 | 350 | 135 | 2,241 |
| 1916 | 211 | 193 | 241 | 255 | 280 | 258 | 167 | 322 | 448 | 653 | 434 | 245 | 3,707 |
| 1917 | 256 | 207 | 237 | 297 | 393 | 344 | 254 | 323 | 576 | 750 | 709 | 338 | 4,683 |
| 1918 | 215 | 206 | 306 | 377 | 481 | 386 | 268 | 410 | 588 | 674 | 598 | 355 | 4,864 |
| 1919 | 353 | 256 | 265 | 378 | 431 | 264 | 227 | 384 | 598 | 815 | 703 | 456 | 5,130 |
| 1920 | 336 | 230 | 230 | 233 | 311 | 262 | 214 | 308 | 480 | 563 | 540 | 274 | 3,981 |
| 1921 | 200 | 162 | 228 | 232 | 207 | 203 | 119 | 341 | 375 | 580 | 449 | 230 | 3,326 |
| 1922 | 223 | 214 | 266 | 223 | 338 | 243 | 216 | 453 | 595 | 792 | 630 | 331 | 4,544 |
| 1923 | 262 | 199 | 186 | 221 | 288 | 220 | 212 | 459 | 608 | 734 | 577 | 338 | 4,304 |
| 1924 | 231 | 165 | 167 | 230 | 267 | 191 | 161 | 293 | 556 | 724 | 497 | 288 | 3,770 |
| 1925 | 194 | 163 | 213 | 254 | 198 | 143 | 234 | 347 | 409 | 681 | 449 | 308 | 3,595 |
| 1926 | 207 | 164 | 171 | 190 | 201 | 158 | 188 | 240 | 495 | 648 | 521 | 273 | 3,456 |
| 1927 | 187 | 162 | 182 | 184 | 215 | 157 | 128 | 252 | 385 | 626 | 548 | 278 | 3,304 |
| 1928 | 215 | 175 | 154 | 216 | 263 | 165 | 175 | 312 | 525 | 704 | 420 | 218 | 3,562 |
| 1929 | 159 | 106 | 146 | 266 | 266 | 157 | 159 | 246 | 394 | 673 | 459 | 219 | 3,250 |

STOCKER AND FEEDER SHIPMENTS, CALVES

| | | | | | | | | | | | | | |
|------|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1915 | 3 | 1 | 2 | 3 | 3 | 3 | 2 | 4 | 8 | 11 | 11 | 6 | 60 |
| 1916 | 10 | 4 | 9 | 7 | 8 | 6 | 5 | 8 | 16 | 29 | 27 | 11 | 140 |
| 1917 | 5 | 6 | 12 | 9 | 8 | 9 | 7 | 8 | 12 | 21 | 20 | 6 | 123 |
| 1918 | 7 | 8 | 13 | 8 | 10 | 7 | 6 | 8 | 16 | 30 | 25 | 11 | 149 |
| 1919 | 11 | 8 | 12 | 12 | 12 | 8 | 9 | 12 | 14 | 24 | 20 | 14 | 156 |
| 1920 | 12 | 10 | 11 | 12 | 11 | 10 | 5 | 6 | 8 | 17 | 13 | 6 | 121 |
| 1921 | 5 | 4 | 8 | 6 | 7 | 6 | 3 | 14 | 19 | 42 | 48 | 16 | 178 |
| 1922 | 10 | 9 | 16 | 11 | 21 | 17 | 7 | 16 | 35 | 72 | 80 | 26 | 330 |
| 1923 | 19 | 12 | 13 | 11 | 12 | 14 | 11 | 21 | 23 | 51 | 47 | 15 | 249 |
| 1924 | 11 | 5 | 8 | 9 | 8 | 10 | 9 | 13 | 24 | 39 | 51 | 21 | 208 |
| 1925 | 12 | 13 | 17 | 17 | 18 | 11 | 9 | 13 | 18 | 37 | 40 | 25 | 230 |
| 1926 | 18 | 13 | 13 | 13 | 17 | 11 | 11 | 12 | 26 | 45 | 49 | 28 | 256 |
| 1927 | 18 | 13 | 18 | 20 | 21 | 13 | 10 | 19 | 22 | 49 | 67 | 41 | 311 |
| 1928 | 18 | 19 | 19 | 18 | 21 | 19 | 21 | 24 | 38 | 95 | 76 | 35 | 403 |
| 1929 | 19 | 11 | 16 | 26 | 28 | 19 | 14 | 20 | 20 | 85 | 97 | 37 | 401 |

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau.

NOTE.—Tables similar to Tables 353 and 354, 1928 Yearbook, receipts, local slaughter, and stocker and feeder shipments of cattle and of calves, are omitted.

TABLE 354.—Feeder cattle, inspected: Shipments from public stockyards, by months, 1929

| Origin and destination | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|
| Market origin: | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number |
| Chicago, Ill. | 8,410 | 8,324 | 8,950 | 7,788 | 7,036 | 3,672 | 5,165 | 10,594 | 21,366 | 39,727 | 23,200 | 13,195 | 157,477 |
| Denver, Colo. | 34,355 | 6,957 | 9,139 | 12,188 | 43,436 | 21,644 | 5,826 | 3,728 | 23,860 | 59,722 | 59,722 | 22,829 | 334,428 |
| East St. Louis, Ill. | 4,330 | 4,026 | 3,059 | 4,715 | 4,032 | 4,404 | 5,669 | 15,221 | 15,221 | 91,035 | 11,809 | 67,401 | 99,079 |
| Fort Worth, Tex. | 9,500 | 8,989 | 12,222 | 47,361 | 23,019 | 14,721 | 12,204 | 11,301 | 19,720 | 27,412 | 33,832 | 16,408 | 236,889 |
| Indianapolis, Ind. | 1,635 | 1,500 | 1,768 | 1,566 | 1,616 | 2,321 | 2,526 | 2,556 | 3,413 | 3,351 | 3,348 | 1,306 | 27,996 |
| Kansas City, Kans. | 34,271 | 30,069 | 31,450 | 29,542 | 27,885 | 22,735 | 31,683 | 60,346 | 95,830 | 158,641 | 102,811 | 54,963 | 771,968 |
| Louisville, Ky. | 622 | 1,427 | 1,359 | 2,067 | 1,499 | 6,625 | 1,144 | 1,439 | 1,882 | 1,710 | 1,309 | 4,377 | 16,554 |
| Oklahoma City, Okla. | 5,853 | 3,054 | 4,646 | 8,697 | 6,716 | 5,320 | 4,361 | 7,318 | 7,768 | 15,185 | 11,360 | 4,877 | 55,370 |
| Omaha, Neb. | 18,313 | 12,627 | 14,376 | 15,376 | 11,266 | 9,151 | 8,101 | 26,275 | 73,249 | 111,505 | 67,458 | 30,407 | 38,447 |
| Sioux City, Iowa | 13,710 | 7,624 | 12,312 | 12,249 | 10,601 | 8,977 | 14,106 | 24,529 | 43,391 | 72,286 | 44,362 | 21,947 | 96,014 |
| South St. Joseph, Mo. | 2,090 | 1,121 | 2,315 | 2,902 | 2,508 | 4,268 | 4,782 | 6,321 | 8,373 | 15,730 | 7,721 | 3,267 | 90,932 |
| South St. Paul, Minn. | 7,056 | 4,369 | 8,267 | 13,488 | 14,177 | 10,192 | 17,419 | 28,102 | 28,691 | 38,067 | 27,355 | 11,547 | 8,758 |
| Wichita, Kans. | 8,345 | 7,681 | 10,468 | 27,859 | 10,609 | 3,923 | 3,542 | 8,577 | 9,194 | 34,242 | 28,845 | 12,757 | 4,035 |
| All other inspected | 13,998 | 11,720 | 14,362 | 23,112 | 25,792 | 23,217 | 24,925 | 26,521 | 33,783 | 58,069 | 42,546 | 27,411 | 1,389 |
| Total | 162,488 | 109,488 | 133,813 | 208,930 | 190,212 | 135,223 | 141,358 | 230,304 | 386,640 | 690,740 | 463,678 | 227,322 | 1,196 |
| State destination: | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number |
| Colorado | 12,600 | 4,749 | 4,537 | 6,228 | 13,743 | 12,901 | 5,124 | 3,069 | 10,383 | 56,580 | 32,861 | 12,011 | 787 |
| Illinois | 14,604 | 10,835 | 11,189 | 13,164 | 11,148 | 11,076 | 18,565 | 34,735 | 53,257 | 70,251 | 42,178 | 21,877 | 832 |
| Indiana | 4,655 | 3,206 | 5,127 | 5,033 | 4,679 | 4,783 | 7,669 | 12,056 | 14,140 | 132,135 | 14,262 | 6,773 | 123 |
| Iowa | 24,534 | 13,857 | 21,075 | 20,140 | 18,532 | 17,621 | 25,672 | 50,910 | 88,217 | 99,210 | 85,078 | 40,207 | 249 |
| Kansas | 30,269 | 23,938 | 26,267 | 60,827 | 32,131 | 13,261 | 14,169 | 26,961 | 34,511 | 99,210 | 63,169 | 38,443 | 546 |
| Kentucky | 1,693 | 2,355 | 2,513 | 6,166 | 4,592 | 2,626 | 3,759 | 2,996 | 3,850 | 7,522 | 4,699 | 2,433 | 123 |
| Michigan | 1,010 | 861 | 1,503 | 2,040 | 3,328 | 2,246 | 2,780 | 3,427 | 4,651 | 7,246 | 4,414 | 1,767 | 412 |
| Minnesota | 956 | 241 | 1,185 | 1,797 | 2,144 | 2,426 | 3,091 | 4,651 | 7,698 | 10,416 | 5,337 | 1,611 | 527 |
| Missouri | 8,647 | 9,193 | 10,358 | 11,292 | 9,253 | 7,506 | 8,284 | 13,969 | 25,684 | 45,326 | 38,140 | 14,747 | 379 |
| Nebraska | 31,662 | 13,354 | 15,421 | 20,488 | 34,574 | 17,900 | 13,022 | 26,423 | 60,983 | 109,141 | 71,519 | 33,657 | 243 |
| Ohio | 1,392 | 2,202 | 2,634 | 3,526 | 3,909 | 3,808 | 5,249 | 11,503 | 14,312 | 20,762 | 10,178 | 4,147 | 616 |
| Oklahoma | 8,428 | 6,601 | 9,948 | 25,863 | 12,669 | 8,404 | 4,109 | 8,963 | 12,385 | 23,963 | 23,195 | 9,647 | 113 |
| Pennsylvania | 2,088 | 2,022 | 2,102 | 2,379 | 2,669 | 3,207 | 4,284 | 4,345 | 5,140 | 6,487 | 4,950 | 6,067 | 541 |
| South Dakota | 3,146 | 2,800 | 3,580 | 4,755 | 3,541 | 3,541 | 284 | 9,570 | 10,196 | 16,457 | 11,862 | 4,004 | 267 |
| Texas | 8,987 | 7,057 | 8,383 | 13,148 | 8,683 | 10,126 | 10,016 | 9,570 | 18,966 | 24,617 | 23,664 | 13,664 | 155,013 |
| Wisconsin | 512 | 349 | 1,281 | 1,850 | 3,023 | 1,122 | 1,001 | 1,477 | 2,102 | 3,810 | 2,057 | 1,244 | 19,816 |
| All other | 7,355 | 7,554 | 6,701 | 11,367 | 20,482 | 13,647 | 13,447 | 9,077 | 12,737 | 30,823 | 25,115 | 13,896 | 172,207 |
| Total | 162,488 | 109,488 | 133,813 | 208,930 | 190,212 | 135,223 | 141,358 | 230,304 | 386,640 | 690,740 | 463,678 | 227,322 | 3,071,196 |

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

* Includes 6 head shipped to Alaska.

TABLE 355.—Feeder cattle, inspected: Shipments from public stockyards, 1920-1928

| Origin and destination | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> |
| <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> |
| Market origin: | | | | | | | | | |
| Chicago, Ill. | 339 | 331 | 332 | 275 | 246 | 230 | 245 | 167 | 171 |
| Denver, Colo. | 350 | 237 | 344 | 347 | 346 | 281 | 288 | 328 | 403 |
| East St. Louis, Ill. | 119 | 129 | 184 | 170 | 136 | 113 | 110 | 97 | 90 |
| Fort Worth, Tex. | 309 | 153 | 209 | 162 | 160 | 196 | 233 | 273 | 285 |
| Indianapolis, Ind. | 64 | 51 | 44 | 59 | 49 | 55 | 44 | 29 | 31 |
| Kansas City, Kans. | 751 | 708 | 1,106 | 1,138 | 901 | 825 | 706 | 671 | 684 |
| Louisville, Ky. | 28 | 37 | 42 | 33 | 21 | 27 | 19 | 34 | 24 |
| Oklahoma City, Okla. | 120 | 94 | 91 | 77 | 56 | 78 | 69 | 89 | 80 |
| Omaha, Nebr. | 475 | 396 | 566 | 545 | 476 | 390 | 379 | 329 | 355 |
| Sioux City, Iowa | 219 | 214 | 289 | 281 | 249 | 247 | 300 | 237 | 274 |
| South St. Joseph, Mo. | 62 | 64 | 104 | 97 | 85 | 71 | 56 | 51 | 60 |
| South St. Paul, Minn. | 159 | 144 | 306 | 223 | 173 | 208 | 291 | 203 | 198 |
| Wichita, Kans. | 109 | 128 | 198 | 198 | 193 | 200 | 152 | 198 | 205 |
| All other inspected | 181 | 141 | 224 | 194 | 185 | 177 | 195 | 268 | 344 |
| Total | 3,285 | 2,827 | 4,039 | 3,799 | 3,276 | 3,098 | 3,087 | 2,974 | 3,204 |
| State destination: | | | | | | | | | |
| Colorado | 141 | 96 | 126 | 159 | 166 | 131 | 169 | 180 | 210 |
| Illinois | 294 | 330 | 546 | 500 | 439 | 437 | 435 | 290 | 310 |
| Indiana | 133 | 136 | 151 | 149 | 137 | 150 | 167 | 136 | 113 |
| Iowa | 471 | 468 | 841 | 742 | 570 | 487 | 577 | 431 | 499 |
| Kansas | 440 | 336 | 511 | 511 | 473 | 468 | 378 | 423 | 478 |
| Kentucky | 44 | 60 | 54 | 49 | 25 | 41 | 43 | 86 | 59 |
| Michigan | 55 | 53 | 50 | 46 | 47 | 49 | 41 | 36 | 41 |
| Minnesota | 35 | 25 | 18 | 22 | 31 | 36 | 32 | 25 | 29 |
| Missouri | 310 | 312 | 395 | 418 | 285 | 277 | 255 | 267 | 229 |
| Nebraska | 360 | 378 | 659 | 648 | 565 | 427 | 374 | 386 | 474 |
| Ohio | 102 | 115 | 123 | 113 | 90 | 97 | 102 | 93 | 70 |
| Oklahoma | 186 | 152 | 151 | 115 | 108 | 168 | 159 | 170 | 143 |
| Pennsylvania | 36 | 39 | 41 | 27 | 24 | 31 | 30 | 31 | 70 |
| South Dakota | 54 | 48 | 63 | 70 | 57 | 38 | 32 | 50 | 64 |
| Texas | 307 | 105 | 111 | 95 | 128 | 116 | 151 | 160 | 196 |
| Wisconsin | 42 | 35 | 30 | 23 | 23 | 26 | 29 | 12 | 12 |
| All other | 275 | 139 | 169 | 112 | 108 | 119 | 113 | 198 | 207 |
| Total | 3,285 | 2,827 | 4,039 | 3,799 | 3,276 | 3,098 | 3,087 | 2,974 | 3,204 |

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

¹ Includes 2 head shipped to Alaska in 1925 and 10 head in 1926.

TABLE 356.—Cattle, beef: Estimated average price per 100 pounds received by producers in the United States, 1910-1929

| Year | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Weight- ed aver- age |
|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1910 | 4.71 | 4.64 | 4.87 | 5.31 | 5.23 | 5.20 | 4.84 | 4.64 | 4.65 | 4.64 | 4.48 | 4.45 | 4.78 |
| 1911 | 4.58 | 4.57 | 4.66 | 4.67 | 4.59 | 4.43 | 4.28 | 4.39 | 4.43 | 4.32 | 4.36 | 4.37 | 4.46 |
| 1912 | 4.46 | 4.61 | 4.75 | 5.15 | 5.36 | 5.23 | 5.17 | 5.37 | 5.35 | 5.36 | 5.22 | 5.33 | 5.14 |
| 1913 | 5.40 | 5.55 | 5.88 | 6.08 | 6.01 | 6.02 | 5.98 | 5.91 | 5.92 | 6.05 | 5.99 | 5.96 | 5.91 |
| 1914 | 6.04 | 6.16 | 6.28 | 6.29 | 6.33 | 6.32 | 6.38 | 6.47 | 6.38 | 6.23 | 6.02 | 6.01 | 6.24 |
| 1915 | 5.99 | 5.93 | 5.92 | 5.96 | 6.13 | 6.20 | 6.07 | 6.18 | 6.06 | 6.04 | 5.85 | 5.75 | 6.01 |
| 1916 | 5.85 | 5.99 | 6.37 | 6.60 | 6.73 | 6.91 | 6.78 | 6.51 | 6.55 | 6.37 | 6.44 | 6.56 | 6.48 |
| 1917 | 6.86 | 7.36 | 7.91 | 8.57 | 8.70 | 8.65 | 8.30 | 8.17 | 8.40 | 8.35 | 8.21 | 8.24 | 8.17 |
| 1918 | 8.33 | 8.55 | 8.85 | 9.73 | 10.38 | 10.40 | 10.07 | 9.71 | 9.63 | 9.33 | 9.14 | 9.28 | 9.46 |
| 1919 | 9.65 | 10.02 | 10.34 | 10.81 | 10.84 | 10.20 | 9.96 | 9.82 | 9.02 | 8.65 | 8.65 | 8.63 | 9.61 |
| 1920 | 8.99 | 8.98 | 9.08 | 9.20 | 8.97 | 9.32 | 8.93 | 8.56 | 8.29 | 7.77 | 7.15 | 6.36 | 8.38 |
| 1921 | 6.32 | 6.02 | 6.36 | 6.08 | 5.98 | 5.65 | 5.40 | 5.59 | 4.98 | 4.81 | 4.69 | 4.62 | 5.44 |
| 1922 | 4.75 | 5.07 | 5.46 | 5.53 | 5.70 | 5.84 | 5.76 | 5.50 | 5.44 | 5.48 | 5.29 | 5.28 | 5.43 |
| 1923 | 5.51 | 5.55 | 5.62 | 5.78 | 5.77 | 5.82 | 5.72 | 5.67 | 5.60 | 5.48 | 5.23 | 5.26 | 5.57 |
| 1924 | 5.38 | 5.47 | 5.63 | 5.82 | 5.94 | 5.79 | 5.65 | 5.67 | 5.53 | 5.52 | 5.43 | 5.35 | 5.59 |
| 1925 | 5.63 | 5.69 | 6.18 | 6.55 | 6.48 | 6.46 | 6.55 | 6.56 | 6.27 | 6.29 | 6.14 | 6.18 | 6.26 |
| 1926 | 6.31 | 6.42 | 6.65 | 6.66 | 6.67 | 6.56 | 6.46 | 6.39 | 6.48 | 6.43 | 6.32 | 6.42 | 6.46 |
| 1927 | 6.45 | 6.60 | 6.82 | 7.13 | 7.17 | 7.08 | 7.13 | 7.21 | 7.21 | 7.42 | 7.55 | 8.00 | 7.54 |
| 1928 | 8.48 | 8.72 | 8.81 | 8.92 | 9.09 | 9.10 | 9.19 | 9.51 | 9.06 | 9.63 | 9.27 | 8.94 | 9.18 |
| 1929 | 8.97 | 8.89 | 9.16 | 9.53 | 9.72 | 9.72 | 9.80 | 9.62 | 9.22 | 8.92 | 8.63 | 8.48 | 9.20 |

Bureau of Agricultural Economics. Based on reports of special price reporters. Monthly prices weighted by number of cattle Jan. 1, by States; yearly price obtained by weighting monthly prices by receipts at principal markets.

TABLE 357.—Calves, veal: Estimated average price per 100 pounds received by producers in the United States, 1910-1929

| Year | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Weight- ed average |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1910..... | 6.41 | 6.28 | 6.59 | 6.54 | 6.30 | 6.57 | 6.37 | 6.29 | 6.43 | 6.41 | 6.39 | 6.35 | 6.12 |
| 1911..... | 6.50 | 6.38 | 6.48 | 5.96 | 5.68 | 5.72 | 5.74 | 5.93 | 6.11 | 6.15 | 6.10 | 5.98 | 6.04 |
| 1912..... | 6.06 | 6.07 | 6.11 | 6.22 | 6.23 | 6.33 | 6.33 | 6.62 | 6.83 | 6.90 | 6.77 | 6.88 | 6.45 |
| 1913..... | 7.06 | 7.23 | 7.49 | 7.38 | 7.17 | 7.53 | 7.46 | 7.53 | 7.73 | 7.72 | 7.70 | 7.74 | 7.48 |
| 1914..... | 7.89 | 7.90 | 7.92 | 7.68 | 7.59 | 7.69 | 7.80 | 8.08 | 8.06 | 7.97 | 7.78 | 7.61 | 7.83 |
| 1915..... | 7.66 | 7.62 | 7.50 | 7.31 | 7.35 | 7.53 | 7.87 | 7.75 | 7.80 | 7.91 | 7.69 | 7.61 | 7.63 |
| 1916..... | 7.67 | 7.87 | 8.11 | 8.00 | 8.08 | 8.39 | 8.54 | 8.59 | 8.77 | 8.59 | 8.60 | 8.79 | 8.35 |
| 1917..... | 9.15 | 9.88 | 9.94 | 10.49 | 10.18 | 10.60 | 10.77 | 10.50 | 11.08 | 11.10 | 10.66 | 10.98 | 10.51 |
| 1918..... | 11.16 | 11.17 | 11.33 | 11.71 | 11.62 | 11.88 | 12.33 | 12.22 | 12.57 | 12.35 | 11.94 | 12.31 | 11.91 |
| 1919..... | 12.39 | 12.18 | 12.65 | 12.78 | 12.11 | 12.40 | 13.38 | 13.43 | 13.39 | 12.87 | 12.65 | 12.67 | 12.76 |
| 1920..... | 12.89 | 13.12 | 12.98 | 12.72 | 11.69 | 11.68 | 11.44 | 11.64 | 11.88 | 11.64 | 10.77 | 9.27 | 11.80 |
| 1921..... | 9.34 | 9.08 | 9.05 | 7.73 | 7.55 | 7.43 | 7.37 | 7.31 | 7.67 | 7.61 | 7.20 | 7.14 | 7.81 |
| 1922..... | 7.23 | 7.84 | 7.85 | 7.26 | 7.28 | 7.67 | 7.49 | 7.67 | 8.10 | 8.17 | 7.92 | 7.78 | 7.68 |
| 1923..... | 8.05 | 8.37 | 8.20 | 7.78 | 7.69 | 7.66 | 8.00 | 8.00 | 8.34 | 8.37 | 7.85 | 7.75 | 7.99 |
| 1924..... | 8.36 | 8.51 | 8.43 | 8.33 | 8.14 | 7.91 | 7.88 | 7.94 | 8.09 | 8.22 | 7.89 | 7.84 | 8.12 |
| 1925..... | 8.50 | 8.87 | 9.21 | 8.80 | 8.35 | 8.18 | 8.65 | 8.80 | 9.07 | 9.52 | 9.16 | 9.17 | 8.85 |
| 1926..... | 9.44 | 9.86 | 9.75 | 9.45 | 8.92 | 9.65 | 9.47 | 9.54 | 10.06 | 10.29 | 9.54 | 9.44 | 9.61 |
| 1927..... | 9.75 | 10.10 | 10.10 | 9.90 | 9.37 | 9.46 | 9.82 | 10.37 | 10.78 | 11.04 | 10.67 | 10.71 | 10.16 |
| 1928..... | 10.88 | 11.30 | 11.34 | 11.18 | 11.18 | 11.56 | 11.87 | 12.32 | 13.05 | 12.62 | 11.99 | 11.82 | 11.79 |
| 1929..... | 12.20 | 12.17 | 12.51 | 12.10 | 12.11 | 12.06 | 12.40 | 12.39 | 12.52 | 12.16 | 11.80 | 11.69 | 12.18 |

Bureau of Agricultural Economics. Based on reports of special price reporters. Monthly prices weighed by number of milk cows Jan. 1, by States; yearly price obtained by weighting monthly prices by receipts at principal markets.

TABLE 358.—Cattle, choice steers for chilled beef: Average price per 100 pounds, by months, Buenos Aires, 1909-1929

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1909..... | 3.00 | 3.03 | 3.07 | 3.00 | 3.07 | 3.20 | 3.41 | 3.64 | 3.95 | 4.38 | 4.21 | 3.81 | 3.48 |
| 1910..... | 3.34 | 3.30 | 3.61 | 3.61 | 3.54 | 3.64 | 3.71 | 3.98 | 4.28 | 4.62 | 4.32 | 3.47 | 3.78 |
| 1911..... | 3.57 | 3.61 | 3.84 | 3.81 | 3.84 | 3.95 | 4.15 | 4.18 | 4.21 | 4.18 | 4.01 | 3.47 | 3.90 |
| 1912..... | 3.58 | 3.78 | 3.62 | 3.73 | 3.72 | 3.71 | 3.71 | 4.05 | 4.15 | 4.15 | 4.15 | 4.08 | 3.87 |
| 1913..... | 4.22 | 4.19 | 4.44 | 4.93 | 5.26 | 5.02 | 5.10 | 5.12 | 5.12 | 5.22 | 5.35 | 5.18 | 4.93 |
| 1914..... | 4.96 | 5.27 | 5.47 | 5.60 | 5.47 | 5.67 | 5.73 | 6.01 | 6.21 | 6.29 | 5.86 | 5.80 | 5.70 |
| 1915..... | 5.72 | 5.61 | 5.56 | 5.65 | 5.14 | 5.54 | 5.97 | 6.71 | 7.45 | 7.52 | 7.11 | 6.59 | 6.24 |
| 1916..... | 6.93 | 7.15 | 6.91 | 6.93 | 6.84 | 6.31 | 6.42 | 6.54 | 6.84 | 7.16 | 6.95 | 6.74 | 6.81 |
| 1917..... | 6.69 | 6.56 | 6.49 | 6.31 | 6.46 | 6.34 | 6.37 | 6.40 | 6.16 | 6.54 | 6.03 | 5.55 | 6.32 |
| 1918..... | 5.39 | 5.83 | 5.88 | 6.06 | 6.04 | 5.98 | 6.21 | 7.49 | 8.41 | 8.49 | 8.03 | 8.06 | 6.82 |
| 1919..... | 7.96 | 7.75 | 7.74 | 7.85 | 8.03 | 7.21 | 8.60 | 8.92 | 9.63 | 9.20 | 8.25 | 7.72 | 8.24 |
| 1920..... | 7.96 | 7.97 | 8.20 | 8.06 | 7.88 | 7.56 | 7.47 | 7.42 | 7.15 | 7.27 | 6.28 | 5.98 | 7.43 |
| 1921..... | 5.93 | 5.95 | 5.71 | 5.41 | 4.40 | 4.10 | 3.69 | 4.12 | 4.74 | 4.96 | 4.90 | 4.39 | 4.86 |
| 1922..... | 4.68 | 4.53 | 3.97 | 3.30 | 3.31 | 3.90 | 4.41 | 4.50 | 4.24 | 3.84 | 3.30 | 3.25 | 3.94 |
| 1923..... | 3.08 | 3.25 | 3.82 | 4.06 | 3.83 | 3.56 | 3.62 | 3.36 | 3.82 | 4.10 | 3.48 | 3.23 | 3.60 |
| 1924..... | 3.19 | 3.40 | 3.61 | 3.50 | 3.56 | 3.76 | 4.51 | 4.93 | 5.15 | 5.95 | 5.62 | 5.42 | 4.38 |
| 1925..... | 5.54 | 5.54 | 6.20 | 6.20 | 6.51 | 6.48 | 6.54 | 6.72 | 6.91 | 6.25 | 5.66 | 5.32 | 6.16 |
| 1926..... | 5.40 | 5.42 | 5.27 | 5.39 | 5.52 | 5.24 | 5.58 | 5.70 | 5.45 | 4.63 | 4.06 | 4.21 | 6.16 |
| 1927..... | 4.21 | 4.73 | 4.63 | 5.03 | 4.81 | 5.15 | 5.95 | 6.55 | 6.84 | 7.13 | 6.34 | 5.81 | 5.52 |
| 1928..... | 6.11 | 5.86 | 6.21 | 6.33 | 6.65 | 6.99 | 6.79 | 6.60 | 6.67 | 6.38 | 6.61 | 5.32 | 6.29 |
| 1929..... | 5.83 | 5.89 | 5.87 | 5.76 | 5.93 | 5.98 | 6.07 | 6.07 | 6.06 | 6.68 | 6.19 | ----- | ----- |

*Bureau of Agricultural Economics. Calculated from quotations in the Review of the River Plate, Prices prior to May, 1924, originally quoted on basis of price per head supplemented from 1916 by price per pound of dressed carcass weight. Calculations assume average dressed weight of 730 pounds or live weight of 1,269 pounds. Live-weight quotations per pound from May, 1924. Converted at average monthly rate of exchange as given in Federal Reserve Bulletins.

BEEF CATTLE, HOGS, SHEEP, HORSES, AND MULES

833

TABLE 359.—Cattle and calves: Monthly average price per 100 pounds, Chicago, 1900-1929

BEEF STEERS¹

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1900 | 5.20 | 4.85 | 4.85 | 4.95 | 5.10 | 5.20 | 5.25 | 5.40 | 5.35 | 5.25 | 5.15 | 5.00 | 5.15 |
| 1901 | 4.85 | 4.80 | 4.95 | 5.15 | 5.30 | 5.55 | 5.10 | 5.10 | 5.50 | 5.45 | 5.50 | 5.65 | 5.25 |
| 1902 | 5.70 | 5.55 | 6.05 | 6.45 | 6.60 | 6.95 | 7.10 | 7.05 | 6.65 | 6.20 | 5.20 | 4.80 | 6.20 |
| 1903 | 4.80 | 4.60 | 4.75 | 4.90 | 4.80 | 4.90 | 4.95 | 5.00 | 4.95 | 4.70 | 4.45 | 4.55 | 4.80 |
| 1904 | 4.65 | 4.50 | 4.60 | 4.65 | 4.85 | 5.60 | 5.40 | 5.10 | 5.10 | 5.20 | 4.95 | 4.40 | 4.95 |
| 1905 | 4.65 | 4.75 | 5.00 | 5.75 | 5.45 | 5.25 | 4.95 | 5.00 | 5.05 | 4.80 | 4.65 | 4.75 | 5.05 |
| 1906 | 5.00 | 5.05 | 5.15 | 5.05 | 5.20 | 5.20 | 5.40 | 5.45 | 5.50 | 5.60 | 5.60 | 5.50 | 5.30 |
| 1907 | 5.60 | 5.55 | 5.55 | 5.65 | 5.65 | 6.20 | 6.40 | 6.25 | 6.10 | 6.10 | 5.40 | 5.10 | 5.80 |
| 1908 | 5.30 | 5.40 | 6.00 | 6.70 | 6.60 | 6.90 | 6.45 | 6.00 | 5.95 | 5.70 | 5.90 | 6.00 | 6.10 |
| 1909 | 6.00 | 5.85 | 6.10 | 6.10 | 6.45 | 6.45 | 6.45 | 6.70 | 6.75 | 6.60 | 6.45 | 6.20 | 6.35 |
| 1910 | 6.20 | 6.35 | 7.35 | 7.55 | 7.50 | 7.50 | 7.10 | 6.85 | 6.80 | 6.60 | 6.20 | 6.00 | 6.80 |
| 1911 | 6.15 | 6.15 | 6.20 | 6.10 | 5.95 | 6.05 | 6.30 | 6.95 | 6.80 | 6.75 | 6.70 | 6.65 | 6.40 |
| 1912 | 6.85 | 6.60 | 7.20 | 7.65 | 7.95 | 8.00 | 7.90 | 8.50 | 8.15 | 7.90 | 8.10 | 7.85 | 7.75 |
| 1913 | 7.80 | 8.25 | 8.30 | 8.15 | 8.00 | 8.15 | 8.25 | 8.30 | 8.50 | 8.40 | 8.25 | 8.20 | 8.25 |
| 1914 | 8.45 | 8.30 | 8.35 | 8.50 | 8.40 | 8.60 | 8.80 | 9.10 | 9.35 | 9.05 | 8.60 | 8.35 | 8.65 |
| 1915 | 8.05 | 7.50 | 7.65 | 7.70 | 8.35 | 8.80 | 9.20 | 9.05 | 8.95 | 8.80 | 8.70 | 8.45 | 8.40 |
| 1916 | 8.35 | 8.35 | 8.75 | 9.10 | 9.50 | 9.85 | 9.25 | 9.45 | 9.40 | 9.75 | 10.15 | 10.00 | 9.50 |
| 1917 | 10.15 | 10.50 | 11.25 | 11.75 | 11.90 | 12.15 | 12.35 | 12.70 | 13.10 | 11.70 | 11.10 | 11.40 | 11.60 |
| 1918 | 12.10 | 12.00 | 12.60 | 14.70 | 15.40 | 15.85 | 16.05 | 15.75 | 16.00 | 14.80 | 15.05 | 14.90 | 14.65 |
| 1919 | 15.80 | 15.95 | 16.05 | 15.85 | 15.00 | 13.55 | 15.60 | 16.45 | 15.50 | 16.15 | 15.10 | 11.35 | 15.50 |
| 1920 | 13.95 | 13.05 | 13.10 | 12.30 | 12.25 | 14.95 | 15.00 | 14.85 | 15.05 | 14.20 | 12.00 | 10.10 | 13.30 |
| 1921 | 8.70 | 8.20 | 9.05 | 8.15 | 8.25 | 8.00 | 8.10 | 8.50 | 8.00 | 8.10 | 7.40 | 7.00 | 8.20 |
| 1922 | 7.23 | 7.03 | 7.87 | 7.90 | 8.21 | 8.76 | 9.42 | 9.52 | 9.84 | 10.23 | 9.16 | 8.76 | 8.65 |
| 1923 | 8.88 | 8.62 | 8.70 | 8.81 | 9.28 | 9.74 | 9.71 | 10.36 | 10.18 | 9.94 | 9.46 | 8.96 | 9.10 |
| 1924 | 8.99 | 8.81 | 9.17 | 9.52 | 9.59 | 9.28 | 9.31 | 9.53 | 9.52 | 9.57 | 8.90 | 8.71 | 9.21 |
| 1925 | 8.97 | 9.15 | 9.93 | 9.99 | 9.90 | 10.34 | 11.28 | 11.10 | 11.04 | 10.80 | 10.16 | 9.72 | 10.16 |
| 1926 | 9.48 | 9.42 | 9.42 | 9.11 | 9.07 | 9.51 | 9.44 | 9.30 | 10.00 | 10.00 | 9.48 | 9.43 | 9.47 |
| 1927 | 9.70 | 9.81 | 10.20 | 10.51 | 10.68 | 11.12 | 11.78 | 12.02 | 12.63 | 13.43 | 13.57 | 13.08 | 11.36 |
| 1928 | 13.67 | 13.15 | 12.83 | 13.01 | 13.19 | 13.86 | 15.11 | 15.30 | 15.91 | 14.61 | 13.84 | 12.86 | 13.91 |
| 1929 | 12.51 | 11.92 | 12.68 | 13.52 | 13.67 | 14.10 | 14.59 | 14.22 | 13.92 | 13.81 | 13.00 | 12.74 | 13.43 |

VEAL CALVES

| | | | | | | | | | | | | | |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1901 | 5.85 | 5.95 | 5.75 | 5.15 | 5.25 | 6.00 | 5.75 | 5.25 | 5.85 | 5.90 | 5.60 | 5.00 | 5.65 |
| 1902 | 6.30 | 6.75 | 6.00 | 5.50 | 5.75 | 5.75 | 6.50 | 6.75 | 7.00 | 6.80 | 6.60 | 6.60 | 6.35 |
| 1903 | 7.10 | 7.15 | 6.50 | 5.75 | 5.60 | 6.20 | 5.65 | 6.40 | 6.65 | 6.40 | 5.75 | 4.95 | 6.20 |
| 1904 | 5.85 | 6.35 | 5.65 | 4.60 | 4.60 | 4.90 | 5.75 | 5.60 | 5.90 | 6.10 | 6.00 | 6.00 | 5.60 |
| 1905 | 6.15 | 6.50 | 5.70 | 5.10 | 5.25 | 5.85 | 5.75 | 5.90 | 6.00 | 6.00 | 6.00 | 6.60 | 5.75 |
| 1906 | 7.00 | 6.40 | 6.25 | 5.60 | 5.65 | 5.80 | 5.60 | 6.00 | 6.75 | 6.50 | 6.25 | 7.00 | 6.25 |
| 1907 | 7.00 | 6.50 | 6.60 | 6.00 | 6.35 | 6.15 | 6.40 | 6.35 | 6.50 | 6.00 | 6.25 | 6.00 | 6.40 |
| 1908 | 6.75 | 6.60 | 6.20 | 5.50 | 5.60 | 5.80 | 6.00 | 6.75 | 7.60 | 7.20 | 6.50 | 7.40 | 6.50 |
| 1909 | 7.60 | 6.85 | 7.00 | 6.30 | 6.35 | 6.50 | 7.00 | 7.50 | 7.60 | 8.10 | 7.40 | 8.25 | 7.10 |
| 1910 | 8.60 | 8.65 | 9.00 | 7.85 | 7.35 | 7.85 | 7.60 | 7.75 | 8.50 | 8.65 | 8.75 | 8.50 | 8.10 |
| 1911 | 8.75 | 8.40 | 7.40 | 6.60 | 7.25 | 7.60 | 7.40 | 8.00 | 8.75 | 8.60 | 8.35 | 7.85 | 7.60 |
| 1912 | 8.75 | 7.50 | 8.00 | 7.40 | 7.75 | 8.00 | 8.75 | 9.75 | 11.25 | 10.00 | 9.85 | 10.25 | 8.75 |
| 1913 | 9.75 | 9.85 | 10.50 | 8.50 | 9.25 | 9.75 | 10.40 | 11.50 | 11.25 | 10.50 | 10.35 | 10.75 | 10.10 |
| 1914 | 11.00 | 10.75 | 9.00 | 8.85 | 9.50 | 9.40 | 10.60 | 11.00 | 11.40 | 10.65 | 10.35 | 8.65 | 9.90 |
| 1915 | 9.85 | 10.35 | 10.00 | 8.40 | 9.15 | 9.60 | 10.25 | 11.50 | 11.25 | 10.85 | 10.15 | 9.65 | 10.15 |
| 1916 | 10.15 | 10.65 | 9.65 | 8.75 | 10.40 | 11.25 | 11.40 | 12.00 | 12.40 | 11.50 | 11.85 | 11.75 | 10.85 |
| 1917 | 13.40 | 12.65 | 13.40 | 12.50 | 13.25 | 13.40 | 13.00 | 15.15 | 15.00 | 14.85 | 13.50 | 15.25 | 13.75 |
| 1918 | 15.35 | 14.15 | 15.25 | 14.50 | 13.50 | 15.55 | 16.70 | 17.25 | 18.60 | 17.10 | 16.80 | 16.50 | 15.75 |
| 1919 | 15.62 | 15.75 | 15.01 | 14.31 | 14.66 | 16.37 | 17.88 | 19.62 | 20.52 | 18.05 | 17.60 | 16.56 | 16.83 |
| 1920 | 17.74 | 16.73 | 16.73 | 14.22 | 12.12 | 13.68 | 13.98 | 15.08 | 16.39 | 14.18 | 13.74 | 10.39 | 14.58 |
| 1921 | 11.49 | 11.02 | 10.33 | 8.12 | 8.66 | 8.72 | 9.73 | 9.39 | 10.71 | 8.68 | 7.70 | 7.81 | 9.36 |
| 1922 | 8.36 | 9.16 | 8.26 | 6.97 | 8.46 | 8.89 | 8.90 | 10.88 | 11.92 | 9.65 | 8.91 | 9.42 | 9.15 |
| 1923 | 10.08 | 10.63 | 9.32 | 8.68 | 9.51 | 9.31 | 10.14 | 10.36 | 10.57 | 9.82 | 8.15 | 9.31 | 9.66 |
| 1924 | 11.08 | 10.54 | 9.75 | 9.03 | 9.30 | 8.74 | 9.48 | 10.63 | 10.72 | 10.10 | 9.02 | 9.97 | 9.86 |
| 1925 | 10.72 | 11.94 | 11.24 | 9.40 | 9.42 | 9.56 | 10.91 | 11.94 | 12.18 | 11.19 | 10.60 | 11.30 | 10.87 |
| 1926 | 12.18 | 12.43 | 12.06 | 9.91 | 11.04 | 11.09 | 11.38 | 12.46 | 12.59 | 11.80 | 11.09 | 11.31 | 11.61 |
| 1927 | 12.20 | 12.40 | 11.54 | 10.90 | 11.07 | 11.68 | 13.32 | 14.75 | 15.94 | 14.42 | 13.48 | 13.09 | 12.90 |
| 1928 | 13.70 | 15.04 | 13.75 | 13.02 | 13.95 | 13.24 | 14.84 | 16.68 | 17.36 | 14.94 | 14.22 | 13.94 | 14.56 |
| 1929 | 15.83 | 14.74 | 15.50 | 14.43 | 13.39 | 14.22 | 15.30 | 15.81 | 16.64 | 13.76 | 13.70 | 13.82 | 14.76 |

Bureau of Agricultural Economics. Prices of beef steers prior to January, 1922, compiled from the Chicago Drovers Journal Yearbook. Subsequent figures are the weighted average price of all grades of beef steers sold out of first hands at Chicago. Veal calf prices prior to January, 1919, compiled from Chicago Drovers Journal Yearbook, and later from data of the livestock and meat reporting service of the bureau.

¹ Western steers not included.

TABLE 360.—Cattle and calves: Average price per 100 pounds at Chicago and Kansas City, by months, July, 1927–December, 1929

CHICAGO

| Month | Slaughter cattle | | | | | | | | | | Vealers (milk-fed) | | | Feeder steers, 850 pounds up | |
|---------------------|----------------------------------|--------|----------------------------------|--------|---------------------|--------|------------------------------|------------------------|-----------------|--------|-----------------------|------------------------|--------|---------------------------------------|--|
| | Beef steers | | | | | | Heifers, 850 pounds up | | Cows | | | | | | |
| | 1,300 to 1,500 pounds, choice | | 1,100 to 1,300 pounds, choice | | 950-1,100 pounds |  |  |  |  |  |  |  |  |  |  | 800 pounds up |
| | Choice | Good | Medium | Common | Choice | Good | Good | Common and me- dium | Good and choice | Medium | Good and choice | Common and me- dium | | | |
| 1927 | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | |
| July | 14.06 | 13.61 | 13.00 | 11.63 | 10.19 | 8.18 | 11.00 | 9.66 | 7.68 | 6.17 | 13.32 | 12.01 | 9.00 | 7.75 | |
| August | 14.17 | 14.04 | 13.75 | 12.18 | 10.08 | 7.84 | 11.38 | 9.87 | 7.80 | 6.05 | 14.75 | 13.15 | 9.15 | 7.81 | |
| September | 15.31 | 15.21 | 15.04 | 13.11 | 10.59 | 7.80 | 12.16 | 10.64 | 8.15 | 6.28 | 15.94 | 14.01 | 9.68 | 8.05 | |
| October | 16.62 | 16.54 | 16.31 | 14.12 | 11.09 | 8.03 | 12.84 | 11.29 | 8.14 | 6.52 | 14.42 | 13.26 | 10.08 | 8.24 | |
| November | 17.88 | 17.73 | 17.60 | 15.06 | 11.67 | 8.40 | 12.85 | 11.41 | 8.48 | 6.61 | 13.48 | 12.12 | 10.73 | 8.89 | |
| December | 17.75 | 17.51 | 17.16 | 14.96 | 12.00 | 9.17 | 12.53 | 11.46 | 9.31 | 7.18 | 13.09 | 11.08 | 11.13 | 9.30 | |
| Average 6 months | 15.96 | 15.78 | 15.48 | 13.51 | 10.94 | 8.24 | 12.13 | 10.72 | 8.26 | 6.47 | 14.17 | 12.70 | 9.96 | 8.36 | |
| 1928 | | | | | | | | | | | | | | | |
| January | 18.02 | 17.68 | 17.24 | 15.18 | 12.81 | 10.12 | 12.66 | 11.62 | 9.79 | 7.59 | 13.70 | 11.86 | 11.42 | 9.41 | |
| February | 16.78 | 16.42 | 16.01 | 14.47 | 12.32 | 9.99 | 12.30 | 11.46 | 9.41 | 7.63 | 15.04 | 13.24 | 11.76 | 9.89 | |
| March | 15.09 | 14.86 | 14.66 | 13.66 | 12.27 | 9.96 | 12.13 | 11.12 | 9.40 | 7.46 | 13.75 | 11.81 | 11.77 | 9.99 | |
| April | 14.62 | 14.50 | 14.32 | 13.53 | 12.24 | 10.00 | 12.36 | 11.58 | 9.60 | 8.24 | 13.02 | 10.79 | 12.04 | 10.19 | |
| May | 14.36 | 14.37 | 14.40 | 13.53 | 12.22 | 10.49 | 12.78 | 11.89 | 10.06 | 8.31 | 13.95 | 11.69 | 12.17 | 10.42 | |
| June | 14.50 | 14.63 | 14.70 | 13.96 | 12.72 | 10.98 | 13.30 | 12.17 | 10.19 | 8.42 | 13.24 | 11.26 | 12.38 | 10.62 | |
| July | 15.86 | 15.90 | 15.98 | 15.03 | 13.41 | 10.78 | 14.18 | 13.19 | 10.52 | 8.37 | 14.84 | 12.88 | 12.51 | 10.62 | |
| August | 16.27 | 16.39 | 16.48 | 15.34 | 13.24 | 10.52 | 14.68 | 13.67 | 10.67 | 8.45 | 16.68 | 14.27 | 12.74 | 10.62 | |
| September | 17.76 | 17.78 | 17.75 | 16.09 | 13.77 | 10.96 | 15.26 | 14.18 | 10.70 | 8.47 | 17.36 | 15.43 | 13.08 | 10.72 | |
| October | 17.18 | 17.25 | 17.36 | 15.58 | 13.01 | 10.38 | 14.35 | 13.52 | 10.08 | 8.05 | 14.94 | 13.47 | 12.16 | 10.06 | |
| November | 16.97 | 17.02 | 17.17 | 15.11 | 12.64 | 10.22 | 13.54 | 12.44 | 9.71 | 7.82 | 14.22 | 12.51 | 11.61 | 10.02 | |
| December | 16.11 | 16.15 | 16.36 | 14.34 | 12.16 | 10.12 | 12.54 | 11.62 | 9.06 | 7.44 | 13.94 | 12.10 | 11.41 | 9.86 | |
| Average | 16.13 | 16.08 | 16.04 | 14.65 | 12.73 | 10.38 | 13.34 | 12.37 | 9.93 | 8.02 | 14.56 | 12.61 | 12.09 | 10.20 | |
| 1929 | | | | | | | | | | | | | | | |
| January | 15.39 | 15.58 | 15.89 | 14.31 | 12.32 | 10.36 | 12.16 | 11.35 | 9.19 | 7.58 | 15.83 | 13.71 | 11.34 | 9.80 | |
| February | 14.18 | 14.31 | 14.37 | 13.20 | 11.58 | 9.99 | 11.61 | 10.91 | 9.02 | 7.18 | 14.74 | 12.89 | 10.92 | 9.51 | |
| March | 13.89 | 14.08 | 14.30 | 13.42 | 12.41 | 10.63 | 12.31 | 11.55 | 9.49 | 8.03 | 15.50 | 13.08 | 12.02 | 10.36 | |
| April | 14.47 | 14.49 | 14.55 | 13.87 | 12.86 | 11.10 | 12.96 | 12.24 | 9.92 | 8.67 | 14.43 | 11.74 | 12.59 | 10.90 | |
| May | 14.55 | 14.62 | 14.72 | 13.94 | 12.96 | 11.64 | 13.39 | 12.65 | 10.47 | 8.83 | 13.39 | 10.64 | 12.91 | 11.07 | |
| June | 15.17 | 15.18 | 15.16 | 14.35 | 13.36 | 11.96 | 13.51 | 12.68 | 10.20 | 8.64 | 14.22 | 11.62 | 12.77 | 11.00 | |
| July | 16.05 | 16.02 | 15.85 | 14.41 | 12.76 | 10.91 | 13.56 | 12.57 | 9.81 | 8.09 | 15.36 | 13.21 | 12.76 | 10.78 | |
| August | 16.40 | 16.42 | 16.43 | 14.57 | 12.17 | 9.86 | 13.56 | 12.46 | 9.89 | 7.80 | 15.81 | 13.31 | 11.95 | 9.86 | |
| September | 16.02 | 16.08 | 16.13 | 14.34 | 11.98 | 9.79 | 13.42 | 12.28 | 9.74 | 7.76 | 16.64 | 13.90 | 11.21 | 9.32 | |
| October | 15.75 | 15.82 | 15.92 | 14.24 | 12.10 | 9.90 | 12.84 | 11.88 | 8.96 | 7.29 | 13.76 | 11.90 | 10.90 | 9.12 | |
| November | 14.38 | 14.96 | 15.27 | 13.81 | 11.73 | 9.70 | 12.84 | 11.72 | 8.46 | 6.81 | 13.70 | 11.56 | 10.28 | 8.73 | |
| December | 14.30 | 15.00 | 15.47 | 13.89 | 11.80 | 9.52 | 12.74 | 11.24 | 8.58 | 6.92 | 13.82 | 11.27 | 10.47 | 9.12 | |
| Average | 15.05 | 15.21 | 15.34 | 14.03 | 12.34 | 10.45 | 12.91 | 11.96 | 9.47 | 7.84 | 14.76 | 12.40 | 11.68 | 9.96 | |

TABLE 360.—Cattle and calves: Average price per 100 pounds at Chicago and Kansas City, by months, July, 1927–December, 1929—Continued

KANSAS CITY

| Month | Slaughter cattle | | | | | | | | | | Vealers (milk-fed) | | Feeder steers, 850 pounds up | |
|---------------------|-------------------------|-------------------------|---------------------|--------|------------------|--------|------------------------------|--------|------------------------|-----------------|-----------------------|-----------------|---------------------------------------|--------|
| | Beef steers | | | | Cows | | | | | | | | | |
| | 1,500 pounds, choice | 1,300 pounds, choice | 950-1,100 pounds | | 800 pounds up | | Heifers, 850 pounds up | | Common and me- dium | Good and choice | Medium | Good and choice | Common and me- dium | |
| | | | Choice | Good | Medium | Common | Choice | Good | | | | | | |
| 1927 | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. | Dolla. |
| July | 13.40 | 12.66 | 12.21 | 10.91 | 9.32 | 7.28 | 10.47 | 9.43 | 7.23 | 5.73 | 11.14 | 8.97 | 9.25 | 7.38 |
| August | 13.42 | 13.04 | 13.04 | 11.35 | 9.36 | 7.25 | 11.18 | 9.93 | 7.25 | 5.76 | 12.04 | 9.45 | 9.29 | 7.39 |
| September | 14.41 | 14.36 | 14.24 | 12.23 | 9.48 | 7.16 | 11.63 | 10.22 | 7.34 | 5.91 | 11.76 | 8.85 | 9.28 | 7.17 |
| October | 15.50 | 15.48 | 15.47 | 13.26 | 9.98 | 7.21 | 12.15 | 10.59 | 7.62 | 6.30 | 12.48 | 9.51 | 9.52 | 7.18 |
| November | 16.90 | 16.83 | 16.68 | 14.12 | 10.70 | 7.72 | 12.43 | 10.84 | 7.87 | 6.48 | 11.84 | 9.12 | 10.17 | 7.67 |
| December | 16.53 | 16.50 | 16.36 | 13.95 | 10.96 | 7.91 | 12.12 | 10.65 | 8.21 | 6.65 | 10.45 | 8.19 | 10.47 | 8.08 |
| Average 6 months | 15.03 | 14.81 | 14.67 | 12.64 | 9.98 | 7.42 | 11.66 | 10.28 | 7.59 | 6.15 | 11.62 | 9.02 | 9.66 | 7.48 |
| 1928 | | | | | | | | | | | | | | |
| January | 17.37 | 17.16 | 16.83 | 14.74 | 11.80 | 8.70 | 12.24 | 10.91 | 9.20 | 7.41 | 11.00 | 9.02 | 11.27 | 8.94 |
| February | 16.05 | 15.61 | 15.31 | 13.68 | 11.63 | 8.86 | 11.75 | 10.61 | 9.09 | 7.37 | 12.48 | 9.69 | 11.49 | 9.35 |
| March | 14.30 | 14.06 | 13.92 | 12.79 | 11.35 | 8.89 | 11.58 | 10.55 | 9.12 | 7.38 | 11.34 | 8.45 | 11.59 | 9.37 |
| April | 14.00 | 13.84 | 13.67 | 12.82 | 11.62 | 9.58 | 11.72 | 10.84 | 9.26 | 7.68 | 10.99 | 8.01 | 11.61 | 9.42 |
| May | 13.70 | 13.69 | 13.77 | 12.85 | 11.72 | 9.97 | 12.15 | 11.37 | 9.54 | 8.12 | 12.00 | 9.00 | 11.74 | 9.69 |
| June | 13.86 | 13.96 | 14.29 | 13.28 | 12.02 | 10.13 | 12.66 | 11.70 | 9.48 | 8.18 | 11.69 | 9.05 | 11.91 | 9.91 |
| July | 15.35 | 15.39 | 15.48 | 14.47 | 12.54 | 10.00 | 13.67 | 12.66 | 9.73 | 8.02 | 12.12 | 9.40 | 12.38 | 10.06 |
| August | 15.10 | 15.38 | 15.75 | 14.50 | 12.35 | 9.66 | 13.75 | 12.69 | 9.64 | 7.90 | 12.84 | 9.75 | 12.58 | 10.12 |
| September | 16.56 | 16.69 | 16.82 | 14.85 | 12.33 | 9.85 | 14.05 | 12.94 | 9.72 | 8.02 | 14.12 | 10.52 | 12.62 | 10.07 |
| October | 15.99 | 16.08 | 16.29 | 14.11 | 11.54 | 9.23 | 13.69 | 12.56 | 9.18 | 7.66 | 12.20 | 9.19 | 11.87 | 9.64 |
| November | 15.66 | 15.67 | 15.92 | 13.70 | 11.28 | 9.02 | 13.28 | 12.04 | 9.25 | 7.59 | 12.19 | 9.58 | 11.26 | 9.34 |
| December | 15.10 | 15.22 | 15.58 | 13.32 | 10.88 | 8.98 | 12.41 | 11.34 | 8.82 | 7.30 | 11.85 | 9.36 | 11.05 | 9.17 |
| Average | 15.25 | 15.23 | 15.30 | 13.76 | 11.76 | 9.40 | 12.75 | 11.68 | 9.34 | 7.72 | 12.07 | 9.25 | 11.78 | 9.59 |
| 1929 | | | | | | | | | | | | | | |
| January | 14.34 | 14.47 | 14.90 | 12.89 | 11.06 | 9.31 | 11.58 | 10.69 | 8.78 | 7.36 | 13.75 | 10.73 | 11.46 | 9.47 |
| February | 13.08 | 13.22 | 13.58 | 12.15 | 10.73 | 9.13 | 10.88 | 10.03 | 8.50 | 7.42 | 12.98 | 10.28 | 11.10 | 9.32 |
| March | 13.12 | 13.37 | 13.84 | 12.81 | 11.70 | 10.22 | 11.65 | 10.71 | 9.18 | 7.90 | 14.40 | 11.68 | 12.14 | 10.34 |
| April | 13.68 | 13.86 | 14.08 | 13.30 | 12.25 | 10.56 | 12.34 | 11.35 | 9.80 | 8.46 | 13.36 | 10.45 | 12.42 | 10.67 |
| May | 13.81 | 13.92 | 14.18 | 13.32 | 12.26 | 10.57 | 12.73 | 11.89 | 10.10 | 8.71 | 12.07 | 9.62 | 12.60 | 10.70 |
| June | 14.52 | 14.55 | 14.54 | 13.47 | 12.41 | 10.54 | 12.87 | 12.04 | 9.92 | 8.33 | 11.71 | 9.36 | 12.60 | 10.55 |
| July | 15.38 | 15.30 | 15.27 | 13.83 | 12.16 | 9.82 | 13.13 | 11.99 | 9.28 | 7.56 | 12.40 | 9.80 | 12.37 | 10.16 |
| August | 15.50 | 15.48 | 15.46 | 13.38 | 10.84 | 8.46 | 12.95 | 11.63 | 8.79 | 7.15 | 12.16 | 9.32 | 11.44 | 9.18 |
| September | 15.03 | 15.03 | 15.13 | 13.15 | 10.50 | 8.07 | 12.88 | 11.56 | 8.62 | 6.98 | 13.12 | 10.22 | 10.74 | 8.62 |
| October | 14.57 | 14.59 | 15.02 | 13.18 | 10.52 | 8.37 | 12.54 | 11.43 | 8.31 | 6.90 | 11.58 | 9.98 | 10.39 | 8.54 |
| November | 13.53 | 13.75 | 14.28 | 12.74 | 10.27 | 8.35 | 12.48 | 11.26 | 8.09 | 6.54 | 11.50 | 9.00 | 10.09 | 8.35 |
| December | 13.30 | 13.67 | 14.29 | 13.02 | 10.82 | 9.00 | 12.20 | 11.08 | 8.01 | 6.49 | 11.40 | 8.70 | 10.50 | 8.67 |
| Average | 14.16 | 14.27 | 14.55 | 13.10 | 11.29 | 9.37 | 12.35 | 11.30 | 8.95 | 7.48 | 12.54 | 9.84 | 11.49 | 9.55 |

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Earlier data in 1927 Yearbook, pp. 991-994.

TABLE 361.—*Cattle and calves: Monthly slaughter ¹ under Federal inspection, 1907–1929*

CATTLE

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands |
| 1907 | 718 | 570 | 555 | 635 | 620 | 588 | 641 | 603 | 666 | 801 | 596 | 546 | 7,633 |
| 1908 | 643 | 527 | 520 | 463 | 491 | 525 | 563 | 640 | 768 | 821 | 681 | 637 | 7,279 |
| 1909 | 587 | 490 | 551 | 508 | 536 | 544 | 608 | 652 | 732 | 892 | 799 | 765 | 7,714 |
| 1910 | 632 | 527 | 509 | 533 | 551 | 621 | 615 | 679 | 796 | 831 | 780 | 644 | 7,808 |
| 1911 | 626 | 536 | 562 | 499 | 509 | 614 | 591 | 720 | 692 | 828 | 746 | 605 | 7,619 |
| 1912 | 675 | 515 | 564 | 522 | 563 | 511 | 508 | 632 | 644 | 808 | 691 | 620 | 7,253 |
| 1913 | 622 | 490 | 484 | 555 | 547 | 556 | 593 | 582 | 656 | 701 | 602 | 590 | 6,978 |
| 1914 | 585 | 499 | 476 | 474 | 474 | 490 | 505 | 518 | 650 | 744 | 658 | 682 | 6,757 |
| 1915 | 573 | 466 | 552 | 507 | 534 | 574 | 596 | 590 | 641 | 736 | 702 | 681 | 7,153 |
| 1916 | 623 | 550 | 597 | 476 | 564 | 648 | 562 | 743 | 791 | 941 | 972 | 844 | 8,310 |
| 1917 | 823 | 663 | 647 | 654 | 815 | 844 | 784 | 866 | 957 | 1,196 | 1,099 | 1,003 | 10,350 |
| 1918 | 895 | 785 | 828 | 915 | 782 | 830 | 1,020 | 987 | 1,143 | 1,251 | 1,233 | 1,160 | 11,829 |
| 1919 | 1,119 | 701 | 640 | 622 | 721 | 644 | 855 | 859 | 855 | 1,073 | 1,040 | 960 | 10,091 |
| 1920 | 832 | 631 | 683 | 638 | 626 | 657 | 661 | 686 | 825 | 843 | 859 | 667 | 8,609 |
| 1921 | 690 | 526 | 621 | 591 | 570 | 640 | 579 | 680 | 689 | 750 | 686 | 586 | 7,608 |
| 1922 | 642 | 569 | 674 | 590 | 702 | 724 | 697 | 761 | 796 | 884 | 859 | 779 | 8,678 |
| 1923 | 745 | 634 | 688 | 697 | 762 | 737 | 725 | 821 | 810 | 953 | 846 | 756 | 9,163 |
| 1924 | 812 | 669 | 665 | 689 | 773 | 670 | 764 | 786 | 870 | 1,016 | 852 | 926 | 9,583 |
| 1925 | 855 | 656 | 736 | 731 | 749 | 732 | 862 | 811 | 866 | 1,067 | 861 | 927 | 9,853 |
| 1926 | 819 | 695 | 766 | 766 | 758 | 852 | 864 | 811 | 971 | 996 | 947 | 887 | 10,180 |
| 1927 | 766 | 700 | 761 | 742 | 785 | 799 | 743 | 838 | 828 | 895 | 881 | 761 | 9,520 |
| 1928 | 711 | 666 | 695 | 623 | 723 | 706 | 662 | 717 | 764 | 801 | 762 | 667 | 8,467 |
| 1929 | 736 | 569 | 632 | 662 | 676 | 636 | 706 | 726 | 753 | 830 | 731 | 658 | 8,324 |

CALVES

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| 1907 | 128 | 99 | 122 | 205 | 224 | 204 | 221 | 206 | 198 | 187 | 126 | 104 | 2,029 |
| 1908 | 117 | 88 | 137 | 197 | 205 | 211 | 192 | 185 | 187 | 180 | 143 | 116 | 1,959 |
| 1909 | 135 | 95 | 149 | 200 | 228 | 236 | 213 | 196 | 205 | 205 | 171 | 155 | 2,181 |
| 1910 | 132 | 117 | 188 | 222 | 252 | 238 | 198 | 206 | 197 | 188 | 168 | 132 | 2,238 |
| 1911 | 135 | 121 | 180 | 218 | 243 | 232 | 198 | 207 | 184 | 180 | 155 | 128 | 2,189 |
| 1912 | 152 | 126 | 180 | 245 | 258 | 229 | 201 | 192 | 190 | 193 | 163 | 149 | 2,279 |
| 1913 | 139 | 118 | 142 | 212 | 205 | 195 | 182 | 149 | 159 | 157 | 124 | 122 | 1,902 |
| 1914 | 122 | 100 | 145 | 186 | 183 | 187 | 153 | 129 | 130 | 135 | 107 | 119 | 1,697 |
| 1915 | 109 | 96 | 156 | 199 | 205 | 197 | 162 | 141 | 139 | 148 | 141 | 125 | 1,811 |
| 1916 | 129 | 143 | 189 | 233 | 267 | 228 | 178 | 207 | 186 | 204 | 217 | 185 | 2,366 |
| 1917 | 203 | 182 | 212 | 286 | 345 | 277 | 277 | 255 | 272 | 339 | 281 | 216 | 3,144 |
| 1918 | 210 | 193 | 260 | 351 | 357 | 312 | 355 | 274 | 317 | 306 | 272 | 219 | 3,459 |
| 1919 | 295 | 210 | 295 | 383 | 391 | 327 | 400 | 319 | 318 | 375 | 344 | 312 | 3,608 |
| 1920 | 305 | 283 | 390 | 382 | 369 | 431 | 343 | 332 | 348 | 315 | 316 | 245 | 4,058 |
| 1921 | 282 | 254 | 360 | 366 | 367 | 370 | 324 | 304 | 321 | 309 | 292 | 259 | 3,808 |
| 1922 | 268 | 279 | 391 | 365 | 401 | 389 | 329 | 345 | 353 | 383 | 348 | 309 | 4,182 |
| 1923 | 352 | 297 | 368 | 400 | 467 | 348 | 379 | 403 | 338 | 416 | 370 | 324 | 4,508 |
| 1924 | 373 | 346 | 377 | 466 | 470 | 408 | 421 | 374 | 419 | 473 | 392 | 416 | 4,939 |
| 1925 | 394 | 378 | 466 | 496 | 481 | 473 | 473 | 439 | 422 | 486 | 398 | 445 | 5,155 |
| 1926 | 410 | 378 | 464 | 461 | 455 | 480 | 425 | 379 | 408 | 446 | 435 | 410 | 5,358 |
| 1927 | 397 | 377 | 457 | 454 | 462 | 430 | 355 | 389 | 357 | 413 | 411 | 376 | 4,877 |
| 1928 | 383 | 374 | 407 | 438 | 473 | 398 | 362 | 369 | 352 | 405 | 378 | 341 | 4,694 |
| 1929 | 369 | 311 | 409 | 460 | 427 | 344 | 363 | 338 | 365 | 398 | 358 | 346 | 4,484 |

Bureau of Animal Industry.

¹ The figures include rejected carcasses.

TABLE 362.—Cattle and calves, slaughter statistics: Source of supply, classification, slaughter costs, weights, and yields, 1923-1929

| Year and month | Source of supply | | Sex classification | | | Average live cost per 100 pounds | Average live weight | Dressed weight as percentage of live weight | By-product yield (on basis of live weight) | | |
|----------------|------------------|----------|--------------------|------------------|----------|----------------------------------|---------------------|---|--|--------------|----------|
| | Stock-yards | Other | Bulls and stags | Cows and heifers | Steers | | | | Edible fat ¹ | Edible offal | Hides |
| | Per cent | Per cent | Per cent | Per cent | Per cent | Dollars | Pounds | Per cent | Per cent | Per cent | Per cent |
| 1923..... | 89.86 | 10.14 | 4.04 | 48.06 | 47.90 | 6.82 | 952.80 | 54.13 | 3.84 | 2.80 | 6.79 |
| 1924..... | 90.77 | 9.23 | 4.10 | 49.42 | 46.48 | 6.64 | 949.64 | 53.50 | 3.86 | 2.85 | 6.80 |
| 1925..... | 90.74 | 9.26 | 3.38 | 51.31 | 45.31 | 7.11 | 954.06 | 53.06 | 3.61 | 2.94 | 6.77 |
| 1926..... | 89.80 | 10.20 | 3.39 | 49.73 | 46.88 | 7.32 | 964.06 | 53.77 | 3.89 | 3.05 | 6.79 |
| 1927..... | 89.90 | 10.10 | 3.72 | 49.27 | 47.01 | 8.62 | 945.99 | 53.57 | 3.71 | 3.03 | 6.84 |
| 1928..... | 89.90 | 10.10 | 3.88 | 50.78 | 45.34 | 10.59 | 947.93 | 53.54 | 3.92 | 3.15 | 6.63 |
| 1929..... | 88.00 | 11.10 | 3.99 | 47.38 | 48.63 | 10.58 | 954.63 | 54.19 | 4.06 | 3.26 | 6.58 |
| 1929 | | | | | | | | | | | |
| January..... | 89.71 | 10.29 | 3.02 | 49.44 | 47.54 | 10.36 | 967.26 | 54.16 | 4.16 | 3.09 | 6.61 |
| February..... | 89.62 | 10.38 | 2.93 | 48.06 | 49.01 | 9.96 | 972.86 | 54.39 | 4.25 | 3.23 | 6.58 |
| March..... | 88.57 | 11.43 | 3.39 | 45.66 | 50.95 | 10.80 | 969.88 | 55.05 | 4.45 | 3.29 | 6.80 |
| April..... | 88.69 | 11.31 | 3.77 | 41.44 | 54.79 | 11.57 | 969.74 | 55.41 | 4.49 | 3.25 | 6.46 |
| May..... | 87.99 | 12.01 | 5.04 | 41.21 | 53.75 | 11.73 | 957.00 | 55.06 | 4.41 | 3.32 | 6.46 |
| June..... | 86.84 | 13.16 | 5.61 | 42.45 | 52.04 | 11.78 | 946.78 | 55.15 | 4.31 | 3.20 | 6.52 |
| July..... | 87.77 | 12.23 | 4.97 | 42.98 | 52.05 | 11.66 | 947.15 | 54.77 | 4.19 | 3.28 | 6.53 |
| August..... | 89.67 | 10.33 | 4.07 | 45.59 | 50.34 | 10.77 | 941.07 | 54.09 | 3.97 | 3.29 | 6.53 |
| September..... | 89.61 | 10.39 | 3.64 | 47.77 | 48.50 | 10.23 | 940.75 | 53.68 | 3.79 | 3.30 | 6.53 |
| October..... | 90.08 | 9.92 | 3.61 | 53.52 | 42.87 | 9.64 | 942.20 | 53.04 | 3.65 | 3.31 | 6.65 |
| November..... | 89.50 | 10.50 | 3.67 | 56.69 | 39.64 | 9.17 | 945.79 | 52.64 | 3.53 | 3.25 | 6.73 |
| December..... | 87.89 | 12.11 | 4.44 | 51.01 | 44.55 | 9.67 | 965.24 | 53.42 | 3.75 | 3.32 | 6.71 |

CALVES

| Year and month | Source of supply | | Average live cost per 100 pounds | Average live weight | Dressed weight as percentage of live weight | By-product yield (on basis of live weight) | |
|----------------|------------------|----------|----------------------------------|---------------------|---|--|--------------|
| | Stock-yards | Other | | | | Edible fat ¹ | Edible offal |
| | Per cent | Per cent | Dollars | Pounds | Per cent | Per cent | Per cent |
| 1923..... | 86.24 | 13.76 | 7.86 | 172.82 | 57.13 | 0.75 | 3.57 |
| 1924..... | 87.08 | 12.92 | 7.67 | 176.78 | 57.28 | .75 | 3.61 |
| 1925..... | 87.18 | 12.82 | 8.66 | 176.03 | 57.51 | .71 | 3.68 |
| 1926..... | 85.28 | 14.72 | 9.82 | 178.39 | 58.52 | .66 | 3.66 |
| 1927..... | 84.18 | 15.82 | 10.58 | 175.94 | 57.31 | .75 | 3.78 |
| 1928..... | 85.10 | 14.90 | 12.21 | 175.94 | 56.14 | .79 | 3.83 |
| 1929..... | 83.45 | 16.55 | 12.48 | 170.31 | 57.25 | .80 | 4.04 |
| 1929 | | | | | | | |
| January..... | 82.79 | 17.21 | 13.50 | 169.69 | 58.80 | .76 | 3.89 |
| February..... | 83.87 | 16.13 | 13.02 | 166.18 | 58.19 | 1.12 | 4.27 |
| March..... | 83.55 | 16.45 | 13.73 | 156.19 | 58.01 | .88 | 4.31 |
| April..... | 85.35 | 14.65 | 13.28 | 148.44 | 57.94 | .88 | 4.26 |
| May..... | 94.47 | 15.53 | 12.66 | 159.82 | 57.78 | .71 | 4.41 |
| June..... | 82.02 | 17.98 | 12.84 | 175.10 | 57.41 | .74 | 4.25 |
| July..... | 82.90 | 17.10 | 13.01 | 188.47 | 56.42 | .71 | 3.95 |
| August..... | 83.72 | 16.28 | 12.29 | 203.13 | 57.99 | .77 | 3.77 |
| September..... | 84.42 | 15.58 | 12.33 | 204.77 | 55.89 | .81 | 3.53 |
| October..... | 82.83 | 17.17 | 11.19 | 193.15 | 55.61 | .83 | 3.81 |
| November..... | 83.01 | 16.99 | 11.02 | 188.18 | 57.20 | .77 | 4.13 |
| December..... | 81.64 | 18.36 | 11.29 | 175.00 | 56.87 | .73 | 4.25 |

Bureau of Agricultural Economics. Compiled from monthly reports to the bureau from packers and slaughterers, whose slaughterings equaled 75 to 85 per cent of total slaughter under Federal inspection.

¹ Unrendered.

TABLE 363.—*Cattle: Slaughter in specified countries, average pre-war, annual, 1914-1928*

| Year | Argentina, including chilling, freezing, salting, and canned- meat works ¹ | Uruguay, excluding farm ² | Australia | New Zealand ³ | Canada | United States, Federal Inspected |
|------------------------------------|---|--|------------------|-----------------------------|------------------|---|
| | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> |
| Average pre-war ⁴ | 1,691 | 914 | 1,572 | ⁵ 277 | 1,218 | 9,632 |
| 1914..... | 1,589 | 663 | 2,092 | ⁵ 290 | ----- | 8,454 |
| 1915..... | 1,641 | 807 | 1,578 | ----- | ----- | 8,972 |
| 1916..... | 2,102 | 798 | 1,373 | 389 | ----- | 10,677 |
| 1917..... | 2,496 | 1,050 | 1,345 | 344 | ----- | 13,493 |
| 1918..... | 3,292 | 1,062 | 1,335 | 358 | ----- | 15,285 |
| 1919..... | 2,342 | 1,061 | 1,508 | 417 | 1,891 | 14,080 |
| 1920..... | 1,715 | 759 | 1,538 | 371 | 1,776 | 12,667 |
| 1921..... | 1,550 | 717 | 1,649 | 268 | 2,017 | 11,416 |
| 1922..... | 2,231 | 1,109 | 1,907 | 359 | 1,899 | 12,860 |
| 1923..... | 3,338 | 1,393 | 2,049 | 423 | 1,850 | 13,663 |
| 1924..... | 4,321 | 1,173 | 2,505 | 501 | 1,864 | 14,528 |
| 1925..... | 3,871 | 1,233 | 2,434 | 469 | 1,921 | 15,206 |
| 1926..... | 3,510 | 1,293 | 2,160 | 413 | 1,903 | 15,333 |
| 1927..... | 3,718 | 1,239 | 2,189 | 470 | 2,003 | 14,396 |
| 1928..... | 3,303 | ⁶ 1,284 | ----- | ----- | 1,957 | 13,147 |

Bureau of Agricultural Economics. Compiled from official sources and cabled reports from agricultural commissioners abroad.

¹ Including municipal and private slaughterhouses, the figures were as follows in thousands—averages, pre-war, 3,272; 1921-1925, 5,961. The numbers killed in freezing and chilling plants alone were as follows in thousands—1925, 3,333; 1926, 3,060; 1927, 3,234; 1928, 2,830.

² Slaughtering in freezing and chilling plants alone were as follows in thousands—1925, 651; 1926, 714; 1927, 695; 1928, 697.

³ For years ended March 31 following.

⁴ Average for five years immediately preceding war if available, otherwise for any year or years within that period, unless otherwise stated.

⁵ Excluding farm slaughter which averaged only 7,493 for the 10 years 1917-1926.

⁶ Preliminary estimate.

TABLE 364.—*Beef, frozen: Stocks in cold-storage warehouses and meat-packing establishments, United States, 1916-1929*

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|-----------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| 1916..... | 126,374 | 132,266 | 124,954 | 118,279 | 90,176 | 73,025 | 55,109 | 58,867 | 58,303 | 66,319 | 92,815 | 158,148 |
| 1917..... | 202,442 | 190,909 | 169,793 | 154,193 | 118,391 | 103,007 | 109,354 | 108,729 | 100,453 | 119,221 | 179,032 | 235,064 |
| 1918..... | 315,572 | 292,114 | 276,114 | 205,015 | 212,725 | 190,084 | 154,638 | 180,962 | 185,144 | 194,469 | 224,312 | 229,668 |
| 1919..... | 298,818 | 294,514 | 265,293 | 221,725 | 184,586 | 163,913 | 162,639 | 159,279 | 162,069 | 166,244 | 184,196 | 223,311 |
| 1920..... | 261,812 | 252,037 | 223,145 | 196,890 | 170,455 | 130,619 | 95,297 | 77,469 | 67,010 | 68,461 | 68,663 | 89,718 |
| 1921..... | 120,245 | 119,965 | 122,402 | 114,063 | 100,672 | 88,836 | 76,523 | 66,262 | 50,204 | 44,296 | 40,014 | 63,188 |
| 1922..... | 68,495 | 61,522 | 55,785 | 50,772 | 45,341 | 37,548 | 31,593 | 27,727 | 28,210 | 34,611 | 47,920 | 73,027 |
| 1923..... | 91,805 | 89,272 | 75,604 | 65,292 | 54,522 | 41,207 | 34,385 | 24,112 | 24,625 | 27,590 | 43,772 | 71,024 |
| 1924..... | 82,984 | 79,944 | 76,769 | 68,075 | 62,941 | 41,784 | 37,028 | 29,435 | 29,135 | 28,599 | 45,857 | 76,731 |
| 1925..... | 114,034 | 111,947 | 101,599 | 87,684 | 67,271 | 46,887 | 36,452 | 26,970 | 22,879 | 19,755 | 27,008 | 50,436 |
| 1926..... | 59,850 | 55,705 | 51,498 | 43,528 | 32,372 | 26,649 | 23,997 | 23,509 | 21,311 | 25,267 | 38,079 | 59,603 |
| 1927..... | 72,352 | 67,431 | 60,659 | 50,945 | 39,712 | 28,719 | 23,261 | 18,552 | 17,241 | 19,456 | 26,696 | 45,567 |
| 1928..... | 54,968 | 50,673 | 44,017 | 37,625 | 28,253 | 20,654 | 17,256 | 18,896 | 17,603 | 22,463 | 41,635 | 60,189 |
| 1929..... | 77,051 | 72,117 | 67,486 | 60,664 | 51,442 | 39,878 | 35,759 | 31,085 | 32,122 | 38,906 | 51,902 | 70,390 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

TABLE 365.—*Beef, cured and in process of cure: Stocks in cold-storage warehouses and meat-packing establishments, United States, 1916-1929*

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1916..... | 21,443 | 20,852 | 26,959 | 25,811 | 21,869 | 17,324 | 18,915 | 18,589 | 18,450 | 21,653 | 30,013 | 37,958 |
| 1917..... | 37,301 | 35,891 | 37,600 | 30,601 | 29,409 | 30,831 | 35,679 | 32,401 | 30,290 | 31,246 | 32,223 | 38,325 |
| 1918..... | 39,243 | 38,793 | 37,575 | 34,106 | 29,217 | 24,804 | 21,968 | 28,065 | 29,981 | 28,713 | 29,339 | 32,381 |
| 1919..... | 36,267 | 35,810 | 31,246 | 30,699 | 27,822 | 27,089 | 29,244 | 30,943 | 35,526 | 37,328 | 37,595 | 35,547 |
| 1920..... | 37,052 | 36,715 | 37,002 | 35,047 | 30,333 | 26,653 | 26,355 | 23,617 | 22,711 | 19,594 | 20,352 | 22,448 |
| 1921..... | 22,567 | 22,926 | 24,006 | 24,282 | 21,516 | 20,716 | 19,697 | 17,829 | 17,130 | 15,526 | 14,472 | 17,144 |
| 1922..... | 16,313 | 16,774 | 17,997 | 18,744 | 19,166 | 19,304 | 19,113 | 19,304 | 20,081 | 18,961 | 19,884 | 22,602 |
| 1923..... | 24,450 | 24,841 | 24,987 | 25,210 | 24,013 | 23,816 | 22,835 | 21,781 | 21,416 | 20,597 | 19,649 | 22,142 |
| 1924..... | 22,593 | 22,711 | 23,238 | 25,199 | 25,482 | 24,285 | 22,390 | 20,377 | 19,771 | 18,939 | 21,387 | 23,508 |
| 1925..... | 28,930 | 28,758 | 29,210 | 28,634 | 28,952 | 27,731 | 25,102 | 22,704 | 22,335 | 20,964 | 20,473 | 23,128 |
| 1926..... | 25,146 | 24,833 | 26,192 | 27,253 | 27,606 | 25,930 | 24,691 | 22,539 | 20,386 | 20,983 | 23,119 | 26,374 |
| 1927..... | 28,521 | 27,823 | 27,361 | 26,214 | 23,216 | 21,694 | 20,495 | 17,170 | 16,205 | 16,422 | 17,220 | 19,778 |
| 1928..... | 21,979 | 20,978 | 19,732 | 19,631 | 17,941 | 16,558 | 14,982 | 13,546 | 13,462 | 14,760 | 16,401 | 19,444 |
| 1929..... | 21,862 | 21,873 | 21,285 | 20,943 | 19,272 | 17,437 | 16,296 | 14,845 | 15,892 | 17,438 | 20,167 | 23,054 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

NOTE.—A table similar to Table 368, 1928 Yearbook, wholesale and retail prices of beef, is omitted. Also one similar to Table 370, 1928 Yearbook, livestock and meat situation.

TABLE 366.—Beef and beef products: International trade, average 1911–1913, annual 1925–1928

| Country | Average, 1911–1913 | | | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
|--------------------------------------|--------------------|-----------|-----------|--------------|--------------|--------------|-----------|--------------|--------------|--------------|-------------------|--------------|
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | | | | | | | | | | | | |
| Argentina..... | 1,000 pounds | 940,300 | 14 | 1,000 pounds | 1,000 pounds | 1,000 pounds | 41 | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Uruguay..... | 144 | 119,675 | 0 | 378,078 | 0 | 366,562 | 0 | 340,970 | 0 | 340,970 | 0 | 340,970 |
| Australia ¹ | 1,437 | 301,852 | 1,930 | 381,233 | 1,567 | 308,042 | 1,567 | 308,042 | 847 | 204,356 | 1,304,080 | 224,479 |
| Netherlands..... | 246,296 | 286,176 | 211,157 | 248,405 | 170,473 | 188,114 | 170,473 | 188,114 | 170,819 | 250,270 | 128,595 | 169,385 |
| United States..... | 17,668 | 213,722 | 15,870 | 102,640 | 20,106 | 158,612 | 42,574 | 154,043 | 42,574 | 154,043 | 81,029 | 233,390 |
| Brazil..... | 48,969 | 171 | 11,512 | 135,073 | 7,329 | 97,742 | 2,176 | 76,282 | 2,176 | 76,282 | 18,768 | 118,768 |
| New Zealand..... | 398 | 80,543 | 11,872 | 138,672 | 365 | 97,742 | 105,300 | 588 | 105,300 | 602 | 58,781 | 85,781 |
| Denmark..... | 18,815 | 43,435 | 11,942 | 61,214 | 13,242 | 42,304 | 14,824 | 9,978 | 10,485 | 9,978 | 10,485 | 9,978 |
| Canada..... | 3,091 | 6,448 | 3,233 | 14,106 | 361 | 20,340 | 59,130 | 2,560 | 2,560 | 2,560 | 2,560 | 2,560 |
| Rumania..... | 4 | 2,506 | 437 | 13,492 | 773 | 31,628 | 2,234 | 16,256 | 14,471 | 9,109 | 17,777 | 17,777 |
| Union of South Africa..... | 17,622 | 8,781 | 9,601 | 22,734 | 6,186 | 34,968 | 4,624 | 4,624 | 2,205 | 2,205 | 4,624 | 4,624 |
| China..... | 85 | 3,762 | 377 | 7,518 | 2,811 | 6,010 | 35 | 3,247 | 35 | 3,247 | 35 | 3,247 |
| Hungary..... | 12,863 | 3,762 | 833 | 8,508 | 79 | 6,010 | 35 | 3,247 | 35 | 3,247 | 35 | 3,247 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | | | |
| United Kingdom..... | 1,252,292 | 27,595 | 1,854,596 | 39,089 | 1,899,726 | 34,029 | 1,834,663 | 45,381 | 1,729,104 | 332,852 | 1,729,104 | 332,852 |
| Germany..... | 212,150 | 62,942 | 442,963 | 3,060 | 440,823 | 2,138 | 440,823 | 2,138 | 440,823 | 2,138 | 440,823 | 2,138 |
| France..... | 41,318 | 62,361 | 240,865 | 37,029 | 180,325 | 24,051 | 175,471 | 30,897 | 69,791 | 83,105 | 69,791 | 83,105 |
| Belgium..... | 6,034 | 1,577 | 191,802 | 32,467 | 130,789 | 58,559 | 128,271 | 27,925 | 83,105 | 83,105 | 83,105 | 83,105 |
| Japan..... | 9,002 | 1,577 | 54,819 | 0 | 73,707 | 0 | 73,707 | 0 | 73,707 | 0 | 73,707 | 0 |
| Cuba..... | 37,822 | 0 | 49,444 | 0 | 39,917 | 0 | 43,897 | 0 | 43,897 | 0 | 43,897 | 0 |
| Italy..... | 26,131 | 0 | 26,757 | 574 | 24,152 | 278 | 26,243 | 275 | 24,213 | 24,213 | 24,213 | 24,213 |
| Norway..... | 20,267 | 2,337 | 16,697 | 754 | 16,445 | 1,830 | 14,446 | 1,750 | 12,745 | 12,745 | 12,745 | 12,745 |
| Sweden..... | 12,912 | 17,285 | 20,720 | 12,904 | 19,430 | 7,645 | 17,253 | 3,697 | 14,228 | 14,228 | 14,228 | 14,228 |
| Czechoslovakia..... | 0 | 0 | 17,243 | 207 | 10,775 | 5,375 | 5,153 | 5,797 | 2,736 | 2,736 | 2,736 | 2,736 |
| Spain..... | 966 | 38 | 18,413 | 0 | 12,821 | 0 | 21,019 | 0 | 5,535 | 5,535 | 5,535 | 5,535 |
| Irish Free State..... | 0 | 0 | 11,102 | 8,115 | 10,760 | 7,318 | 10,996 | 5,535 | 5,535 | 5,535 | 5,535 | 5,535 |
| British India..... | 7,434 | 773 | 10,239 | 1,289 | 13,716 | 1,230 | 11,465 | 1,114 | 10,421 | 10,421 | 10,421 | 10,421 |
| Philippine Islands..... | 15,837 | 0 | 10,317 | 749 | 12,052 | 0 | 11,465 | 902 | 7,620 | 7,620 | 7,620 | 7,620 |
| Switzerland..... | 9,052 | 440 | 5,483 | 608 | 6,969 | 773 | 6,913 | 650 | 6,913 | 6,913 | 6,913 | 6,913 |
| Switzerland..... | 476 | 9 | 3,801 | 101 | 4,302 | 4 | 4,302 | 12 | 4,302 | 4,302 | 4,302 | 4,302 |
| British Malaya..... | 14,755 | 9 | 3,469 | 101 | 5,209 | 55 | 6,010 | 12 | 4,302 | 4,302 | 4,302 | 4,302 |
| Egypt..... | 6,836 | 298 | 8,763 | 190 | 5,168 | 127 | 6,010 | 12 | 4,302 | 4,302 | 4,302 | 4,302 |
| Finland..... | 14,755 | 9 | 3,469 | 101 | 5,209 | 55 | 6,010 | 12 | 4,302 | 4,302 | 4,302 | 4,302 |
| Chile..... | 2,023,704 | 2,161,464 | 3,270,775 | 3,459,988 | 3,146,747 | 3,188,028 | 3,104,568 | 3,210,056 | 2,023,058 | 2,023,058 | 2,023,058 | 2,023,058 |
| Total, 33 countries..... | 2,023,704 | 2,161,464 | 3,270,775 | 3,459,988 | 3,146,747 | 3,188,028 | 3,104,568 | 3,210,056 | 2,023,058 | 2,023,058 | 2,023,058 | 2,023,058 |

Bureau of Agricultural Economics. Official sources.

¹ Year ending June 30.¹ Calendar year.¹ Average for Austria-Hungary.

TABLE 367.—Cattle: Tick eradication; progress and status of the work June 30, 1929

| State | Quarantined counties | | Released counties June 30, 1929 | | | Released counties tick free on | | | Cattle inspected and dipped, year ended June 30, 1929 | |
|---------------------|----------------------|---------------|---------------------------------|---------------------------------|-------------------------|--------------------------------|--------------|--------------|---|------------|
| | July 1, 1906 | June 30, 1929 | Tick free | With one or more infested herds | Total counties released | Nov. 1, 1926 | Nov. 1, 1927 | Nov. 1, 1928 | Herds | Cattle |
| Alabama..... | 67 | 1 | 59 | 7 | 66 | 49 | 57 | 59 | 336,816 | 1,817,354 |
| Arkansas..... | 75 | 20 | 45 | 10 | 55 | 41 | 44 | 45 | 92,267 | 451,557 |
| California..... | 15 | 0 | 15 | 0 | 15 | 15 | 15 | 15 | 0 | 0 |
| Florida..... | 67 | 41 | 22 | 4 | 26 | 12 | 14 | 22 | 139,394 | 2,205,414 |
| Georgia..... | 168 | 0 | 164 | 4 | 158 | 151 | 153 | 154 | 11,320 | 225,890 |
| Kentucky..... | 2 | 0 | 2 | 0 | 2 | 2 | 2 | 2 | 0 | 0 |
| Louisiana..... | 64 | 41 | 8 | 15 | 23 | 11 | 4 | 8 | 83,349 | 969,974 |
| Mississippi..... | 82 | 23 | 45 | 14 | 59 | 47 | 46 | 45 | 681,473 | 3,534,582 |
| Missouri..... | 4 | 0 | 4 | 0 | 4 | 4 | 4 | 4 | 0 | 0 |
| North Carolina..... | 73 | 0 | 73 | 0 | 73 | 73 | 71 | 73 | 4,670 | 29,045 |
| Oklahoma..... | 61 | 0 | 54 | 7 | 61 | 55 | 54 | 54 | 33,518 | 228,150 |
| South Carolina..... | 46 | 0 | 46 | 0 | 46 | 40 | 44 | 46 | 8,245 | 50,049 |
| Tennessee..... | 42 | 0 | 42 | 0 | 42 | 42 | 42 | 42 | 0 | 0 |
| Texas..... | 198 | 72 | 79 | 47 | 126 | 72 | 77 | 79 | 531,646 | 9,784,249 |
| Virginia..... | 31 | 0 | 29 | 2 | 31 | 27 | 26 | 29 | 1,815 | 8,158 |
| Total..... | 985 | 198 | 677 | 110 | 787 | 641 | 653 | 677 | 1,924,513 | 19,295,422 |

Bureau of Animal Industry. More than 15,500 vats were in use for official dipping during the year.

TABLE 368.—Cattle and calves: Shipments and slaughter, by States, average 1924-1928, annual 1928

| State and division | Average, 1924-1928 ¹ | | | | | | | | | | 1928 ¹ | | | | | | | | | |
|---------------------|---------------------------------|-----------------|----------------|-----------------|---|----------------|-----------------|----------------|-----------------|----------------|-------------------------------|-----------------|----------------|-----------------|---|---|-----------------|----------------|-----------------|----------------|
| | Shipments and local slaughter | | | | | Farm slaughter | | | | | Shipments and local slaughter | | | | | Inshipments, stocker, feeder, breeding, and dairy | | | | |
| | Cattle | | Calves | | Inshipments, stocker, feeder, breeding, and dairy | Cattle | | Calves | | Farm slaughter | Cattle | | Calves | | Inshipments, stocker, feeder, breeding, and dairy | Cattle | | Calves | | Farm slaughter |
| | Head | Weight per head | Head | Weight per head | | Head | Weight per head | Head | Weight per head | | Head | Weight per head | Head | Weight per head | | Head | Weight per head | Head | Weight per head | |
| | Thou- sands | Pounds | Thou- sands | Pounds | Thou- sands | Thou- sands | Pounds | Thou- sands | Pounds | Thou- sands | Thou- sands | Pounds | Thou- sands | Pounds | Thou- sands | Thou- sands | Pounds | Thou- sands | Pounds | Thou- sands |
| Maine..... | 28 | 804 | 58 | 121 | 1 | 800 | 9 | 125 | 24 | 19,380 | 53 | 3,630 | 1 | 800 | 8 | 5,600 | 20 | 2,500 | | |
| New Hampshire..... | 18 | 814 | 40 | 121 | 1 | 818 | 2 | 805 | 7 | 128 | 11 | 820 | 1 | 820 | 3 | 2,400 | 7 | 910 | | |
| Vermont..... | 44 | 810 | 150 | 122 | 2 | 818 | 10 | 806 | 14 | 125 | 40 | 32,980 | 139 | 1,640 | 9 | 7,200 | 18 | 2,250 | | |
| Massachusetts..... | 35 | 812 | 84 | 123 | 16 | 828 | 4 | 806 | 4 | 125 | 35 | 8,700 | 73 | 16,150 | 3 | 2,430 | 4 | 500 | | |
| Rhode Island..... | 4 | 818 | 14 | 124 | 2 | 823 | 0.6 | 810 | | | 4 | 3,260 | 12 | 1,475 | 3 | 2,490 | | | | |
| Connecticut..... | 17 | 811 | 71 | 125 | 2 | 837 | 3 | 809 | 3 | 125 | 12 | 9,760 | 69 | 8,575 | 3 | 2,490 | | | | |
| New York..... | 220 | 842 | 740 | 151 | 33 | 823 | 36 | 834 | 62 | 150 | 231 | 194,750 | 717 | 109,940 | 48 | 39,600 | 35 | 28,400 | 55 | 8,250 |
| New Jersey..... | 26 | 900 | 83 | 142 | 17 | 850 | 3 | 912 | 3 | 160 | 35 | 31,500 | 82 | 12,300 | 26 | 22,100 | 3 | 2,850 | 3 | 480 |
| Pennsylvania..... | 197 | 875 | 462 | 150 | 96 | 750 | 51 | 850 | 59 | 150 | 251 | 219,925 | 422 | 63,300 | 142 | 106,500 | 38 | 32,300 | 50 | 7,500 |
| North Atlantic..... | 589 | 848 | 1,701 | 143 | 170 | 785 | 118 | 833 | 176 | 143 | 643 | 548,525 | 1,600 | 230,240 | 245 | 192,590 | 100 | 82,980 | 158 | 22,515 |
| Ohio..... | 317 | 850 | 481 | 160 | 100 | 700 | 33 | 825 | 22 | 200 | 297 | 252,450 | 429 | 68,640 | 78 | 64,600 | 28 | 23,100 | 20 | 4,000 |
| Indiana..... | 390 | 900 | 337 | 150 | 181 | 725 | 17 | 812 | 20 | 250 | 358 | 322,700 | 322 | 48,300 | 159 | 115,275 | 15 | 11,625 | 19 | 4,750 |
| Illinois..... | 967 | 943 | 474 | 149 | 539 | 664 | 19 | 825 | 41 | 200 | 790 | 732,700 | 485 | 69,250 | 497 | 372,750 | 18 | 14,850 | 35 | 7,000 |
| Michigan..... | 245 | 841 | 386 | 159 | 51 | 737 | 28 | 800 | 55 | 164 | 237 | 195,525 | 367 | 56,885 | 26 | 27,600 | 28 | 22,400 | 67 | 10,720 |
| Wisconsin..... | 469 | 968 | 1,059 | 113 | 49 | 700 | 14 | 800 | 82 | 125 | 500 | 497,500 | 1,071 | 117,810 | 74 | 51,800 | 10 | 9,000 | 90 | 11,250 |
| Minnesota..... | 694 | 871 | 698 | 143 | 205 | 700 | 37 | 844 | 67 | 200 | 663 | 578,310 | 671 | 93,940 | 251 | 175,700 | 35 | 28,750 | 68 | 13,600 |
| Iowa..... | 1,783 | 968 | 359 | 155 | 693 | 715 | 22 | 811 | 39 | 228 | 1,476 | 388,200 | 828 | 50,700 | 408 | 265,200 | 25 | 20,750 | 35 | 10,500 |
| Missouri..... | 1,018 | 895 | 346 | 150 | 458 | 650 | 14 | 775 | 19 | 250 | 827 | 743,275 | 338 | 50,700 | 714 | 492,960 | 12 | 9,300 | 16 | 4,000 |
| North Dakota..... | 364 | 828 | 102 | 155 | 41 | 700 | 21 | 865 | 21 | 200 | 299 | 249,965 | 95 | 13,300 | 59 | 107,100 | 16 | 12,480 | 20 | 4,000 |
| South Dakota..... | 662 | 865 | 91 | 230 | 89 | 700 | 14 | 865 | 17 | 268 | 559 | 483,535 | 95 | 13,300 | 153 | 107,100 | 12 | 10,380 | 13 | 3,900 |
| Nebraska..... | 1,463 | 948 | 176 | 280 | 676 | 712 | 28 | 840 | 21 | 320 | 1,272 | 1,204,000 | 189 | 53,600 | 671 | 469,700 | 25 | 21,000 | 21 | 7,350 |
| Kansas..... | 1,633 | 914 | 200 | 281 | 1,034 | 709 | 29 | 795 | 15 | 316 | 1,541 | 1,417,720 | 228 | 58,760 | 1,092 | 764,400 | 25 | 19,250 | 14 | 4,760 |
| North Central..... | 10,054 | 920 | 4,799 | 156 | 4,114 | 710 | 275 | 821 | 420 | 201 | 8,819 | 8,077,060 | 4,601 | 701,485 | 4,202 | 2,938,085 | 249 | 203,885 | 418 | 85,890 |
| Delaware..... | 3 | 800 | 23 | 135 | 1 | 714 | | | 1 | 135 | 3 | 2,400 | 25 | 3,375 | 1 | 700 | | | 1 | 135 |
| Maryland..... | 34 | 850 | 116 | 135 | 14 | 593 | 4 | 850 | 3 | 135 | 30 | 25,500 | 113 | 15,255 | 33 | 9,100 | 3 | 2,550 | 3 | 405 |
| Virginia..... | 137 | 897 | 162 | 135 | 20 | 663 | 13 | 757 | 10 | 135 | 120 | 108,900 | 133 | 17,955 | 33 | 18,150 | 8 | 6,200 | 10 | 1,300 |
| West Virginia..... | 113 | 888 | 86 | 176 | 16 | 640 | 12 | 767 | 10 | 176 | 88 | 76,425 | 85 | 14,875 | 22 | 13,970 | 8 | 6,600 | 8 | 1,400 |

| | | | | | | | | | | | | | | | | | | | | |
|---------------------|--------|-----|-------|-----|-------|-----|-----|-----|-------|-----|--------|------------|-------|-----------|-------|-----------|-----|---------|-------|---------|
| North Carolina..... | 73 | 700 | 68 | 125 | 0.6 | 700 | 18 | 600 | 18 | 131 | 58 | 40,600 | 58 | 7,250 | 1 | 700 | 18 | 10,800 | 19 | 2,375 |
| South Carolina..... | 67 | 700 | 34 | 125 | 1 | 700 | 9 | 600 | 9 | 125 | 52 | 36,400 | 23 | 2,875 | 1 | 700 | 6 | 3,600 | 10 | 1,250 |
| Georgia..... | 157 | 486 | 78 | 150 | 4 | 500 | 33 | 500 | 33 | 175 | 130 | 65,000 | 81 | 12,150 | 6 | 3,000 | 30 | 15,000 | 33 | 5,775 |
| Florida..... | 89 | 526 | 62 | 121 | 1 | 700 | 15 | 492 | 6 | 134 | 82 | 38,950 | 69 | 7,935 | 1 | 700 | 13 | 6,175 | 5 | 625 |
| South Atlantic..... | 672 | 709 | 629 | 139 | 59 | 631 | 103 | 599 | 89 | 153 | 563 | 394,175 | 587 | 81,670 | 78 | 47,020 | 86 | 50,925 | 89 | 13,315 |
| Kentucky..... | 274 | 827 | 215 | 159 | 141 | 700 | 10 | 750 | 11 | 220 | 247 | 203,950 | 211 | 33,610 | 107 | 74,900 | 8 | 6,000 | 7 | 1,550 |
| Tennessee..... | 189 | 818 | 136 | 144 | 14 | 700 | 14 | 790 | 19 | 175 | 174 | 140,880 | 122 | 16,720 | 15 | 10,500 | 8 | 6,000 | 14 | 2,450 |
| Alabama..... | 163 | 525 | 61 | 150 | 10 | 500 | 18 | 500 | 18 | 175 | 121 | 63,525 | 51 | 7,650 | 13 | 5,200 | 23 | 11,500 | 25 | 4,375 |
| Mississippi..... | 229 | 601 | 90 | 150 | 2 | 500 | 13 | 540 | 11 | 160 | 237 | 142,200 | 83 | 12,450 | 4 | 2,000 | 11 | 5,940 | 12 | 1,920 |
| Arkansas..... | 159 | 659 | 45 | 175 | 5 | 500 | 23 | 550 | 17 | 200 | 147 | 92,725 | 54 | 9,450 | 14 | 1,000 | 15 | 8,250 | 12 | 2,400 |
| Louisiana..... | 146 | 600 | 71 | 140 | 15 | 300 | 12 | 500 | 13 | 170 | 119 | 71,400 | 64 | 8,960 | 30 | 12,000 | 10 | 5,000 | 10 | 1,700 |
| Oklahoma..... | 670 | 768 | 185 | 250 | 291 | 695 | 15 | 700 | 20 | 302 | 699 | 534,735 | 192 | 48,000 | 297 | 200,475 | 9 | 6,300 | 21 | 6,510 |
| Texas..... | 1,432 | 790 | 847 | 280 | 198 | 743 | 36 | 650 | 76 | 280 | 1,350 | 1,066,500 | 736 | 206,080 | 343 | 250,360 | 30 | 19,500 | 72 | 20,160 |
| South Central..... | 3,263 | 749 | 1,650 | 229 | 677 | 698 | 144 | 615 | 185 | 236 | 3,094 | 2,315,915 | 1,513 | 342,920 | 823 | 562,465 | 114 | 68,490 | 173 | 41,035 |
| Montana..... | 384 | 900 | 44 | 200 | 39 | 750 | 18 | 900 | 8 | 226 | 350 | 315,000 | 40 | 8,000 | 61 | 45,750 | 15 | 12,900 | 10 | 2,500 |
| Idaho..... | 163 | 896 | 37 | 180 | 7 | 700 | 6 | 800 | 23 | 190 | 145 | 130,500 | 36 | 6,480 | 8 | 5,600 | 6 | 4,800 | 22 | 4,180 |
| Wyoming..... | 217 | 850 | 18 | 340 | 23 | 650 | 8 | 880 | 3 | 345 | 215 | 182,750 | 18 | 6,120 | 37 | 24,050 | 6 | 5,280 | 15 | 1,725 |
| Colorado..... | 592 | 862 | 87 | 254 | 244 | 706 | 14 | 771 | 15 | 292 | 543 | 459,800 | 67 | 18,425 | 240 | 187,200 | 10 | 7,500 | 15 | 4,500 |
| New Mexico..... | 412 | 699 | 115 | 270 | 91 | 638 | 19 | 646 | 3 | 279 | 479 | 335,300 | 103 | 30,900 | 196 | 125,440 | 15 | 10,125 | 4 | 1,200 |
| Arizona..... | 337 | 684 | 81 | 270 | 86 | 697 | 11 | 690 | 2 | 250 | 409 | 280,068 | 91 | 24,570 | 173 | 119,716 | 11 | 7,172 | 2 | 300 |
| Utah..... | 107 | 941 | 38 | 206 | 13 | 750 | 7 | 841 | 9 | 206 | 93 | 86,850 | 38 | 7,600 | 9 | 6,750 | 6 | 5,100 | 9 | 1,800 |
| Nevada..... | 103 | 940 | 24 | 227 | 18 | 800 | 6 | 750 | 4 | 231 | 84 | 78,300 | 28 | 5,720 | 17 | 13,600 | 5 | 3,750 | 2 | 440 |
| Washington..... | 96 | 902 | 80 | 180 | 11 | 750 | 20 | 808 | 44 | 155 | 78 | 71,200 | 77 | 13,860 | 11 | 8,250 | 16 | 13,600 | 40 | 6,200 |
| Oregon..... | 161 | 925 | 58 | 183 | 5 | 750 | 15 | 757 | 42 | 143 | 128 | 124,160 | 48 | 9,600 | 4 | 3,000 | 12 | 9,360 | 40 | 6,200 |
| California..... | 761 | 983 | 362 | 215 | 512 | 851 | 25 | 890 | 25 | 200 | 791 | 735,250 | 357 | 79,180 | 483 | 410,550 | 25 | 21,250 | 25 | 5,000 |
| Far Western..... | 3,332 | 866 | 944 | 225 | 1,049 | 794 | 148 | 798 | 177 | 188 | 3,315 | 2,799,178 | 901 | 210,455 | 1,289 | 949,906 | 127 | 100,837 | 174 | 34,245 |
| United States..... | 17,910 | 868 | 9,723 | 172 | 6,068 | 724 | 788 | 752 | 1,048 | 191 | 16,434 | 14,134,873 | 9,202 | 1,566,770 | 6,387 | 4,680,066 | 676 | 507,117 | 1,012 | 196,980 |

1 Preliminary. Bureau of Agricultural Economics, Estimates Division Crop and Livestock Estimates.

TABLE 369.—*Cattle and calves: Value of production and income, average 1924-1928, annual 1928*

| State and division | Average, 1924-1928 ¹ | | | | 1928 ¹ | | | |
|---------------------|-----------------------------------|----------------------|---------------|---------------------|-----------------------------------|----------------------|---------------|---------------------|
| | Value of amount consumed on farms | Re-ceipts from sales | Gross income | Value of production | Value of amount consumed on farms | Re-ceipts from sales | Gross income | Value of production |
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Maine..... | 151 | 3,106 | 3,256 | 2,755 | 145 | 3,027 | 3,172 | 3,014 |
| New Hampshire..... | 46 | 1,717 | 1,763 | 1,423 | 60 | 1,461 | 1,521 | 1,488 |
| Vermont..... | 179 | 4,886 | 4,565 | 4,252 | 219 | 4,707 | 4,926 | 4,894 |
| Massachusetts..... | 111 | 1,825 | 1,937 | 2,178 | 117 | 1,808 | 1,925 | 2,402 |
| Rhode Island..... | 11 | 242 | 253 | 308 | ..... | 156 | 156 | 811 |
| Connecticut..... | 67 | 1,990 | 2,058 | 1,889 | 28 | 1,724 | 1,752 | 2,008 |
| New York..... | 1,162 | 23,646 | 24,808 | 25,143 | 1,336 | 26,514 | 27,850 | 31,120 |
| New Jersey..... | 76 | 1,789 | 1,865 | 2,269 | 110 | 1,980 | 2,090 | 2,967 |
| Pennsylvania..... | 1,688 | 18,111 | 19,799 | 19,612 | 1,635 | 20,646 | 22,281 | 25,012 |
| North Atlantic..... | 3,191 | 56,812 | 60,303 | 59,829 | 3,650 | 62,023 | 65,678 | 73,241 |
| Ohio..... | 1,514 | 25,900 | 27,414 | 26,060 | 1,648 | 30,503 | 32,151 | 31,950 |
| Indiana..... | 926 | 24,024 | 24,950 | 23,732 | 1,030 | 27,893 | 28,923 | 29,993 |
| Illinois..... | 1,108 | 48,733 | 49,836 | 44,074 | 1,288 | 47,640 | 48,928 | 48,790 |
| Michigan..... | 1,037 | 21,488 | 22,525 | 21,868 | 1,411 | 26,515 | 27,926 | 27,220 |
| Wisconsin..... | 524 | 40,827 | 41,351 | 38,339 | 621 | 53,857 | 54,478 | 49,182 |
| Minnesota..... | 2,298 | 40,791 | 43,089 | 41,964 | 2,960 | 48,219 | 51,179 | 52,288 |
| Iowa..... | 1,950 | 113,097 | 115,047 | 104,793 | 2,761 | 103,397 | 106,158 | 117,146 |
| Missouri..... | 637 | 51,842 | 52,479 | 47,848 | 711 | 52,300 | 53,011 | 55,264 |
| North Dakota..... | 1,003 | 17,644 | 18,647 | 16,683 | 1,136 | 19,166 | 20,302 | 20,711 |
| South Dakota..... | 1,094 | 39,660 | 40,754 | 35,338 | 1,214 | 39,631 | 40,845 | 41,306 |
| Nebraska..... | 2,184 | 87,850 | 90,034 | 78,124 | 2,608 | 88,816 | 91,424 | 90,906 |
| Kansas..... | 1,605 | 70,298 | 71,903 | 68,320 | 1,810 | 72,223 | 74,033 | 85,115 |
| North Central..... | 15,375 | 582,154 | 598,029 | 547,132 | 19,198 | 610,160 | 629,358 | 649,861 |
| Delaware..... | 5 | 553 | 558 | 620 | 6 | 620 | 626 | 737 |
| Maryland..... | 100 | 3,245 | 3,346 | 3,600 | 103 | 3,585 | 3,688 | 4,490 |
| Virginia..... | 311 | 10,227 | 10,537 | 9,835 | 290 | 10,620 | 10,919 | 12,981 |
| West Virginia..... | 277 | 8,269 | 8,546 | 7,661 | 276 | 8,168 | 8,444 | 9,246 |
| North Carolina..... | 261 | 4,108 | 4,389 | 4,019 | 376 | 4,716 | 5,092 | 5,062 |
| South Carolina..... | 81 | 2,781 | 2,862 | 2,379 | 84 | 2,877 | 2,961 | 2,824 |
| Georgia..... | 281 | 5,277 | 5,568 | 4,675 | 356 | 6,411 | 6,767 | 5,951 |
| Florida..... | 81 | 3,101 | 3,182 | 2,292 | 91 | 3,662 | 3,753 | 2,291 |
| South Atlantic..... | 1,416 | 37,562 | 38,978 | 35,081 | 1,562 | 40,668 | 42,250 | 43,662 |
| Kentucky..... | 288 | 12,909 | 13,197 | 14,184 | 284 | 16,017 | 16,301 | 15,796 |
| Tennessee..... | 294 | 10,324 | 10,618 | 9,930 | 262 | 12,019 | 13,181 | 13,755 |
| Alabama..... | 219 | 4,235 | 4,454 | 3,753 | 363 | 4,932 | 5,295 | 5,080 |
| Mississippi..... | 118 | 6,543 | 6,661 | 5,826 | 156 | 9,442 | 9,598 | 8,368 |
| Arkansas..... | 219 | 5,744 | 5,962 | 5,637 | 222 | 7,182 | 7,404 | 7,456 |
| Louisiana..... | 208 | 5,004 | 5,211 | 4,889 | 224 | 5,092 | 5,316 | 5,755 |
| Oklahoma..... | 517 | 20,667 | 21,184 | 22,593 | 571 | 31,125 | 31,696 | 33,159 |
| Texas..... | 1,344 | 72,750 | 74,094 | 68,636 | 1,668 | 85,743 | 87,411 | 87,667 |
| South Central..... | 3,206 | 138,176 | 141,382 | 135,348 | 3,750 | 172,462 | 176,202 | 177,020 |
| Montana..... | 759 | 23,033 | 23,792 | 21,464 | 906 | 27,207 | 28,113 | 27,336 |
| Idaho..... | 198 | 9,943 | 10,142 | 8,966 | 244 | 11,944 | 12,186 | 10,948 |
| Wyoming..... | 416 | 12,369 | 12,785 | 12,401 | 536 | 16,013 | 16,849 | 16,087 |
| Colorado..... | 612 | 25,531 | 26,143 | 23,713 | 632 | 30,031 | 30,663 | 30,822 |
| New Mexico..... | 595 | 17,725 | 18,320 | 14,975 | 758 | 24,172 | 24,930 | 20,338 |
| Arizona..... | 856 | 12,209 | 12,565 | 7,684 | 470 | 15,941 | 16,411 | 9,167 |
| Utah..... | 285 | 6,949 | 7,234 | 6,655 | 318 | 7,999 | 8,317 | 8,227 |
| Nevada..... | 245 | 6,121 | 6,368 | 5,396 | 264 | 6,562 | 6,826 | 5,855 |
| Washington..... | 620 | 8,199 | 8,718 | 8,031 | 698 | 9,370 | 9,978 | 10,296 |
| Oregon..... | 341 | 12,555 | 12,896 | 11,227 | 398 | 13,918 | 14,311 | 13,261 |
| California..... | 1,181 | 33,581 | 34,763 | 30,801 | 1,441 | 41,264 | 42,705 | 39,827 |
| Far Western..... | 5,509 | 168,216 | 173,725 | 151,212 | 6,570 | 204,421 | 210,991 | 193,452 |
| United States..... | 20,497 | 982,920 | 1,012,417 | 928,582 | 24,750 | 1,089,724 | 1,124,474 | 1,137,176 |

Bureau of Agricultural Economics. Estimates division crop and livestock estimates.

¹ Preliminary.

TABLE 370.—*Hogs: Numbers and value per head in the United States, 1840, 1850, 1860, 1867-1929*

| Year | Hogs on farms | | Hogs on farms and elsewhere Jan 1 ³ | Year | Hogs on farms | | Hogs on farms and elsewhere Jan 1 ¹ |
|-------------------|---------------------|------------------------------------|--|-------------------|---------------------|------------------------------------|--|
| | Number ¹ | Value per head Jan. 1 ² | | | Number ¹ | Value per head Jan. 1 ² | |
| | | | | | | | |
| | Thou- sands | Dollars | Thou- sands | | Thou- sands | Dollars | Thou- sands |
| 1840 ⁴ | 26,301 | | | 1898 | 39,760 | 4.39 | 55,109 |
| 1850 ⁴ | 50,354 | | 31,209 | 1899 | 38,652 | 4.40 | 54,900 |
| 1860 ⁴ | 53,513 | | 31,700 | 1900 | 37,079 | 5.28 | 54,419 |
| 1867 | 24,094 | 4.03 | 28,200 | 1900 ¹ | 62,893 | | |
| 1868 | 24,317 | 3.29 | 28,300 | 1900 | 52,600 | | |
| 1869 | 23,316 | 4.65 | 27,600 | 1901 | 53,200 | 6.35 | 55,041 |
| 1870 ⁴ | 25,155 | | | 1902 | 46,800 | 7.43 | 48,419 |
| 1870 | 26,751 | 5.80 | 32,300 | 1903 | 47,200 | 8.22 | 48,833 |
| 1871 | 29,458 | 5.61 | 36,400 | 1904 | 49,500 | 6.50 | 51,213 |
| 1872 | 31,796 | 4.01 | 40,100 | 1905 | 52,000 | 6.33 | 53,790 |
| 1873 | 32,632 | 3.67 | 42,100 | 1906 | 51,600 | 6.53 | 56,489 |
| 1874 | 30,861 | 3.98 | 40,700 | 1907 | 57,300 | 8.05 | 59,283 |
| 1875 | 28,062 | 4.80 | 37,800 | 1908 | 61,300 | 6.30 | 63,121 |
| 1876 | 25,727 | 6.00 | 35,500 | 1909 | 57,000 | 6.92 | 58,972 |
| 1877 | 28,077 | 5.66 | 39,500 | 1910 ⁴ | 58,156 | | |
| 1878 | 32,262 | 4.85 | 46,500 | 1910 | 49,300 | 9.69 | 50,598 |
| 1879 | 34,766 | 3.18 | 51,200 | 1911 | 55,700 | 9.90 | 57,627 |
| 1880 ⁴ | 47,682 | | | 1912 | 55,700 | 8.46 | 47,627 |
| 1880 | 34,034 | 4.28 | 51,200 | 1913 | 54,000 | 10.42 | 55,808 |
| 1881 | 36,248 | 4.70 | 53,100 | 1914 | 51,800 | 10.90 | 53,592 |
| 1882 | 44,122 | 5.97 | 62,900 | 1915 | 57,000 | 10.43 | 58,972 |
| 1883 | 43,270 | 6.75 | 60,000 | 1916 | 59,700 | 8.38 | 61,796 |
| 1884 | 44,201 | 5.57 | 59,600 | 1917 | 56,700 | 12.42 | 58,662 |
| 1885 | 45,143 | 5.02 | 59,300 | 1918 | 61,200 | 20.65 | 63,318 |
| 1886 | 46,092 | 4.26 | 58,900 | 1919 | 63,900 | 23.28 | 66,007 |
| 1887 | 44,613 | 4.48 | 55,500 | 1920 ¹ | 59,346 | | |
| 1888 | 44,347 | 4.98 | 53,600 | 1920 | 59,959 | 20.00 | 62,597 |
| 1889 | 50,302 | 5.79 | 59,200 | 1921 | 58,602 | 13.65 | 61,190 |
| 1890 ⁴ | 57,410 | | | 1922 | 59,559 | 10.59 | 62,179 |
| 1890 | 51,603 | 4.72 | 59,100 | 1923 | 69,044 | 12.31 | 72,682 |
| 1891 | 50,625 | 4.15 | 59,400 | 1924 | 60,361 | 10.30 | 69,281 |
| 1892 | 52,398 | 4.00 | 62,900 | 1925 ⁴ | 59,854 | | |
| 1893 | 46,095 | 6.41 | 56,700 | 1925 | 55,568 | 13.20 | 58,013 |
| 1894 | 45,206 | 5.98 | 57,000 | 1926 | 52,148 | 15.80 | 54,443 |
| 1895 | 44,166 | 4.97 | 57,000 | 1927 | 54,788 | 17.25 | 57,199 |
| 1896 | 42,843 | 4.35 | 56,600 | 1928 | 60,420 | 13.16 | 63,078 |
| 1897 | 40,600 | 4.10 | 55,000 | 1929 | 54,966 | 13.01 | 57,371 |

Bureau of Agricultural Economics. Later revised figures for 1928, 1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Prior to 1900 estimates for each 10-year period represent an index of annual changes applied to census as based on first report after census data were available; 1900-1919 are tentative revised estimates of the Bureau of Agricultural Economics as first published in 1927 Yearbook.

² Series for 1867-1899 are values of all hogs as reported. Data for 1900-1925 are an old series for all hogs as reported, adjusted on basis average relationship between the new and old series from 1926 to 1928. Old series was shown in 1928 Yearbook. Conversion factor was 1.057 (base was old series). Data for 1926-1929 are a new series, referred to above, of average of values by age and sex classification weighted by numbers in each class.

³ Data for swine on farms and elsewhere as of Jan. 1 prior to 1900 estimated by the Bureau of Animal Industry. Census figures prior to 1920 were adjusted to a Jan. 1 basis and to include all ages and all animals in towns, villages, and ranges, as well as on farms. For methods see Department Circular 241. Figures from 1900-1929 are the estimates of the Bureau of Agricultural Economics of swine on farms plus an estimate made by the Bureau of Animal Industry of swine in towns and villages.

⁴ Italic figures are from the census. Figures for census years 1890 and 1900 exclude estimate of unenumerated swine on ranges as follows: 1890, 2,093,970; 1900, 17,276. Census dates were June 1 from 1840 to 1900; Apr. 15, 1910; Jan. 1, 1920 and 1925.

⁵ Original estimate of the Bureau of Agricultural Economics.

⁶ Preliminary.

TABLE 371.—*Hogs, including pigs: Estimated number on farms and value per head, by States, January 1, 1925-1929*

| State and division | Number | | | | | Value per head ¹ | | | | |
|---------------------|----------------|----------------|----------------|----------------|-------------------|-----------------------------|---------|---------|---------|-------------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 ² | 1925 | 1926 | 1927 | 1928 | 1929 ² |
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Dollars | Dollars | Dollars | Dollars | Dollars |
| Maine..... | 56 | 60 | 67 | 70 | 60 | 16.30 | 17.30 | 16.80 | 15.00 | 14.00 |
| New Hampshire..... | 18 | 19 | 23 | 29 | 30 | 15.80 | 15.20 | 16.60 | 16.10 | 15.60 |
| Vermont..... | 45 | 44 | 53 | 56 | 50 | 13.30 | 17.00 | 15.90 | 14.90 | 14.10 |
| Massachusetts..... | 60 | 67 | 84 | 97 | 92 | 15.60 | 17.40 | 18.00 | 15.30 | 15.30 |
| Rhode Island..... | 4 | 4 | 4 | 5 | 5 | 18.20 | 17.80 | 19.20 | 18.60 | 18.00 |
| Connecticut..... | 18 | 18 | 21 | 24 | 22 | 20.90 | 19.30 | 20.50 | 20.20 | 19.60 |
| New York..... | 259 | 249 | 284 | 341 | 290 | 15.50 | 16.50 | 17.40 | 15.10 | 14.20 |
| New Jersey..... | 56 | 56 | 60 | 63 | 54 | 16.10 | 17.80 | 20.10 | 14.90 | 15.50 |
| Pennsylvania..... | 734 | 683 | 731 | 841 | 715 | 14.40 | 16.20 | 17.50 | 14.70 | 13.80 |
| North Atlantic..... | 1,250 | 1,200 | 1,327 | 1,526 | 1,318 | 14.93 | 16.50 | 17.54 | 14.98 | 14.24 |
| Ohio..... | 2,440 | 2,489 | 2,439 | 2,439 | 2,146 | 12.60 | 15.90 | 17.10 | 12.60 | 11.50 |
| Indiana..... | 3,100 | 2,820 | 2,961 | 3,227 | 2,904 | 12.10 | 16.00 | 17.70 | 12.90 | 12.00 |
| Illinois..... | 4,725 | 4,442 | 4,709 | 5,133 | 4,671 | 15.10 | 18.30 | 19.20 | 13.70 | 14.00 |
| Michigan..... | 855 | 820 | 845 | 862 | 690 | 13.40 | 15.20 | 16.80 | 12.40 | 12.40 |
| Wisconsin..... | 1,580 | 1,660 | 1,826 | 1,720 | 1,462 | 12.90 | 16.70 | 17.00 | 12.90 | 14.20 |
| Minnesota..... | 3,600 | 3,456 | 3,786 | 3,710 | 3,302 | 15.50 | 19.00 | 20.30 | 15.10 | 16.00 |
| Iowa..... | 9,633 | 9,633 | 10,060 | 10,900 | 10,246 | 17.00 | 18.70 | 20.20 | 14.40 | 15.00 |
| Missouri..... | 3,864 | 3,671 | 3,991 | 4,270 | 4,070 | 10.00 | 14.40 | 16.10 | 11.70 | 12.20 |
| North Dakota..... | 784 | 682 | 572 | 652 | 687 | 13.10 | 15.90 | 17.40 | 13.80 | 15.00 |
| South Dakota..... | 2,760 | 2,300 | 2,183 | 2,882 | 2,536 | 14.50 | 16.60 | 19.40 | 14.70 | 14.60 |
| Nebraska..... | 4,818 | 4,700 | 4,597 | 5,492 | 4,888 | 14.50 | 17.60 | 19.50 | 15.30 | 15.10 |
| Kansas..... | 2,467 | 2,220 | 2,109 | 2,531 | 2,531 | 12.70 | 15.20 | 16.60 | 13.70 | 12.70 |
| North Central..... | 40,626 | 38,893 | 40,078 | 43,818 | 40,033 | 14.30 | 17.25 | 18.75 | 13.88 | 14.04 |
| Delaware..... | 24 | 21 | 24 | 26 | 24 | 12.60 | 13.70 | 11.30 | 12.00 | 10.80 |
| Maryland..... | 188 | 179 | 192 | 221 | 199 | 12.30 | 14.00 | 15.20 | 12.40 | 10.80 |
| Virginia..... | 584 | 531 | 558 | 642 | 578 | 10.40 | 11.30 | 12.20 | 11.20 | 9.90 |
| West Virginia..... | 184 | 180 | 202 | 232 | 197 | 10.90 | 13.20 | 13.40 | 12.90 | 11.50 |
| North Carolina..... | 894 | 832 | 849 | 951 | 874 | 13.00 | 13.00 | 14.20 | 13.50 | 12.40 |
| South Carolina..... | 580 | 452 | 443 | 509 | 458 | 11.50 | 10.00 | 12.20 | 11.20 | 9.00 |
| Georgia..... | 1,275 | 1,109 | 1,187 | 1,365 | 1,228 | 9.80 | 9.40 | 10.10 | 9.40 | 8.20 |
| Florida..... | 498 | 458 | 485 | 543 | 516 | 6.80 | 7.50 | 7.50 | 7.60 | 8.10 |
| South Atlantic..... | 4,227 | 3,762 | 3,940 | 4,489 | 4,074 | 10.61 | 10.73 | 11.60 | 10.86 | 9.72 |
| Kentucky..... | 932 | 839 | 965 | 1,032 | 826 | 9.40 | 12.40 | 14.40 | 9.80 | 8.40 |
| Tennessee..... | 1,035 | 880 | 968 | 1,026 | 872 | 8.60 | 10.60 | 13.20 | 9.70 | 8.00 |
| Alabama..... | 845 | 776 | 854 | 982 | 874 | 10.10 | 9.90 | 10.60 | 10.40 | 9.50 |
| Mississippi..... | 729 | 678 | 744 | 878 | 729 | 7.90 | 9.80 | 9.60 | 8.90 | 8.70 |
| Arkansas..... | 857 | 823 | 946 | 1,041 | 885 | 8.20 | 9.00 | 10.20 | 8.60 | 8.30 |
| Louisiana..... | 528 | 496 | 511 | 460 | 437 | 8.60 | 8.80 | 10.10 | 9.60 | 10.20 |
| Oklahoma..... | 969 | 736 | 883 | 1,104 | 994 | 9.20 | 10.90 | 14.10 | 11.10 | 9.60 |
| Texas..... | 1,250 | 1,000 | 1,250 | 1,375 | 1,210 | 9.40 | 10.40 | 14.90 | 11.50 | 9.70 |
| South Central..... | 7,145 | 6,228 | 7,121 | 7,898 | 6,827 | 8.98 | 10.32 | 12.48 | 10.07 | 9.02 |
| Montana..... | 280 | 250 | 240 | 288 | 328 | 11.90 | 13.30 | 16.40 | 14.30 | 18.10 |
| Idaho..... | 325 | 276 | 318 | 353 | 318 | 10.40 | 14.00 | 15.20 | 12.90 | 11.70 |
| Wyoming..... | 102 | 90 | 110 | 138 | 149 | 10.30 | 14.60 | 15.40 | 13.50 | 12.30 |
| Colorado..... | 493 | 443 | 443 | 509 | 550 | 10.90 | 13.60 | 16.00 | 13.10 | 12.00 |
| New Mexico..... | 59 | 47 | 64 | 77 | 73 | 10.40 | 13.00 | 14.10 | 10.40 | 10.70 |
| Arizona..... | 19 | 18 | 18 | 19 | 19 | 10.70 | 13.10 | 13.70 | 13.00 | 13.30 |
| Utah..... | 64 | 60 | 75 | 98 | 98 | 10.50 | 12.70 | 13.50 | 11.50 | 10.20 |
| Nevada..... | 25 | 22 | 26 | 29 | 29 | 11.30 | 13.10 | 14.00 | 12.30 | 12.30 |
| Washington..... | 198 | 168 | 198 | 238 | 214 | 12.90 | 14.90 | 17.00 | 14.10 | 12.70 |
| Oregon..... | 223 | 223 | 245 | 270 | 256 | 10.20 | 13.00 | 14.20 | 12.20 | 10.60 |
| California..... | 532 | 468 | 585 | 670 | 670 | 9.70 | 14.60 | 15.00 | 13.60 | 12.60 |
| Far Western..... | 2,320 | 2,065 | 2,322 | 2,689 | 2,704 | 10.73 | 13.87 | 15.37 | 13.22 | 12.11 |
| United States..... | 55,568 | 52,148 | 54,788 | 60,420 | 54,956 | 13.20 | 15.80 | 17.25 | 13.16 | 13.01 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board. Later, revised figures for 1928-1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Sum of total value of subgroups (classified by age and sex), divided by total number and rounded to nearest dime for States. Division and United States averages not rounded. State figures are new weighted value series not comparable to State figures previously published.

² Preliminary.

TABLE 372.—*Hogs: Numbers in countries having 150,000 and over, averages 1909-1913 and 1921-1925, annual 1926-1929*

| Country | Month of estimate | Average 1909-1913 ¹ | Average 1921-1925 ¹ | 1926 | 1927 | 1928 | 1929 |
|--|-----------------------------|--------------------------------|--------------------------------|---------------------|------------------|-------------------|-------------------|
| NORTH AMERICA AND WEST INDIES | | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> |
| Canada..... | June..... | 3,350 | 4,344 | 4,360 | 4,695 | 4,497 | 4,382 |
| United States..... | January..... | 53,390 | 61,827 | 52,148 | 54,788 | 60,617 | 56,880 |
| Mexico..... | June..... | ² 3,811 | ⁴ 1,125 | ² 903 | | | |
| Guatemala..... | | 188 | 57 | 92 | 70 | 89 | |
| Salvador..... | | 220 | | | | | |
| Dominican Republic..... | May..... | | 806 | | | | |
| Haiti..... | | | | 170 | 185 | | |
| Estimated total ⁵ | | 59,200 | 69,200 | | | | |
| SOUTH AMERICA | | | | | | | |
| Colombia..... | | ⁶ 711 | 1,352 | 1,400 | 1,366 | | |
| Venezuela..... | | 195 | 512 | | | | |
| Peru..... | February-April..... | | 449 | | | | |
| Bolivia..... | | 114 | 362 | 498 | | 268 | |
| Chile..... | | 172 | 255 | | | | |
| Brazil..... | September..... | 18,401 | ⁷ 16,169 | | | | |
| Uruguay..... | | ⁸ 180 | 278 | | | | |
| Argentina..... | December ⁹ | ¹⁰ 2,901 | ¹¹ 1,437 | | | | |
| Estimated total ⁵ | | 23,200 | 20,900 | | | | |
| EUROPE | | | | | | | |
| England and Wales..... | June..... | 2,390 | 2,658 | 2,200 | 2,692 | 2,971 | 2,364 |
| Isle of Man..... | do..... | 4 | 4 | 3 | 4 | 4 | |
| Scotland..... | do..... | 150 | 167 | 145 | 197 | 196 | 160 |
| Northern Ireland..... | do..... | 215 | 134 | 159 | 236 | 229 | 192 |
| Irish Free State..... | do..... | 1,046 | 947 | 884 | 1,178 | 1,183 | 945 |
| Norway ¹² | do..... | ¹³ 334 | 216 | 303 | 300 | 283 | |
| Sweden..... | do..... | 1,023 | 1,056 | | 1,369 | | |
| Denmark..... | July..... | 2,715 | 2,314 | 3,122 | 3,731 | 3,363 | 3,616 |
| Holland..... | May-June..... | 1,305 | 1,519 | | | | |
| Belgium..... | December ⁹ | 1,533 | 1,081 | 1,152 | 1,144 | 1,124 | 1,139 |
| France..... | do ⁹ | 7,529 | 5,302 | 5,793 | 5,777 | 6,019 | 6,017 |
| Spain..... | do ⁹ | 2,544 | 4,500 | 5,267 | 5,032 | | |
| Portugal..... | do..... | ¹⁴ 1,111 | 1,019 | | | | |
| Italy..... | March-April..... | 2,685 | 2,630 | ¹⁵ 2,850 | | | |
| Switzerland..... | April..... | ³ 570 | 640 | 635 | | | |
| Germany..... | December ⁹ | 22,533 | 15,776 | 16,200 | 19,424 | 22,899 | 20,070 |
| Austria..... | do ⁹ | 1,932 | 1,399 | | | | |
| Czechoslovakia..... | do ⁹ | 2,516 | 2,201 | 2,539 | | | |
| Hungary..... | April and July..... | 3,322 | 2,424 | 2,520 | 2,387 | 2,662 | 2,582 |
| Yugoslavia..... | January..... | 3,956 | 2,875 | 2,806 | 2,770 | 2,663 | |
| Greece..... | December ⁹ | 346 | 390 | 452 | 510 | 453 | 419 |
| Bulgaria..... | do ⁹ | 546 | 832 | | 1,002 | | |
| Rumania..... | do ⁹ | 3,262 | 2,976 | 3,088 | 3,168 | 3,076 | 2,832 |
| Poland..... | November..... | 5,487 | 5,287 | | 6,333 | | |
| Lithuania..... | Spring..... | 1,358 | 1,521 | 1,441 | 1,010 | 1,060 | |
| Latvia..... | June..... | 557 | 465 | 521 | 535 | 535 | ¹⁶ 388 |
| Estonia..... | July..... | 252 | 299 | 333 | 354 | 327 | 279 |
| Finland..... | September..... | 422 | 378 | 391 | 418 | 435 | |
| Russia, European and Asiatic ¹⁶ | Summer..... | ¹⁷ 20,336 | 17,842 | 20,920 | 22,445 | 25,485 | 21,102 |
| Estimated total (exclusive of Russia) ⁵ | | 71,800 | 61,100 | | | | |
| AFRICA | | | | | | | |
| Union of South Africa..... | April-August..... | ³ 1,082 | 888 | 932 | 870 | ¹⁸ 855 | |
| Madagascar..... | February..... | 600 | 369 | | 335 | 328 | |
| Estimated total ⁵ | | 2,200 | 1,900 | | | | |
| ASIA | | | | | | | |
| China (includes Turkestan and Manchuria)..... | | 76,819 | | | | | |
| Japan..... | December ⁹ | 297 | 590 | 673 | 621 | 677 | |
| Chosen..... | do ⁹ | 629 | 1,078 | 1,150 | 1,221 | 1,244 | 1,277 |
| Formosa..... | do ⁹ | 1,293 | 1,302 | 1,435 | 1,543 | 1,643 | 1,718 |
| Siam..... | March..... | 749 | 864 | | | | |
| Straits Settlements..... | | 139 | 267 | | | | |
| Philippine Islands..... | December ⁹ | 1,763 | 5,768 | 8,885 | 9,298 | 10,508 | |
| Dutch East Indies: Outer Possessions..... | do ⁹ | | 783 | | 833 | | |
| Estimated total (exclusive of Russia) ⁵ | | 82,700 | 87,700 | | | | |

See footnotes at end of table.

TABLE 372.—*Hogs: Numbers in countries having 150,000 and over, averages 1909-1913 and 1921-1925, annual 1926-1929—Continued*

| Country | Month of estimate | Average 1909-1913 ¹ | Average 1921-1925 ¹ | 1926 | 1927 | 1928 | 1929 |
|---|-----------------------|--------------------------------|--------------------------------|----------------|----------------|----------------|----------------|
| OCEANIA | | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| Australia..... | December ² | 910 | 918 | 1,128 | 989 | 878 | |
| New Zealand..... | January | ³ 349 | 396 | 473 | 520 | 587 | 557 |
| Estimated total ⁴ | | 1,300 | 1,300 | | | | |
| Total countries reporting all periods, including Russia: | | | | | | | |
| Pre-war to 1928 (20)..... | | 135,421 | 134,937 | 133,709 | 142,895 | 156,622 | |
| Pre-war to 1929 (19)..... | | 125,107 | 121,722 | 116,955 | 126,545 | 139,110 | 126,919 |
| Estimated world total including Russia ⁵ | | 260,700 | 260,000 | | | | |

Bureau of Agricultural Economics. Official estimates and International Institute of Agriculture unless otherwise stated.

¹ Average for 5-year period if available, otherwise for any year or years within that period unless otherwise stated. In countries having changed boundaries, the figures are estimated for 1 year only for numbers within present boundaries. For the pre-war average the years immediately preceding the war have been used.

² Year 1902.

³ Census figure.

⁴ Incomplete.

⁵ These totals include interpolations for a few countries not reporting each year, and rough estimates for some others.

⁶ Year 1915.

⁷ Year 1920.

⁸ Year 1908.

⁹ Estimate reported as of December have been considered as of January 1 of the following year, i. e., the figure for the number of hogs in France as of December 31, 1925, has been put in the 1926 column.

¹⁰ June, 1914.

¹¹ Year 1922.

¹² Number in rural communities.

¹³ September.

¹⁴ Year 1906.

¹⁵ Unofficial.

¹⁶ Years 1916, 1923 from the Soviet Union Review, April, 1928, p. 52. Years 1924-1927, Statistical Review, October, 1928. Years 1928 and 1929 from Economic Life, August 14, 1929.

¹⁷ Years 1916.

¹⁸ Number in towns assumed to be same as in 1927, i. e., 22,000, and added in for purposes of comparison with preceding years.

¹⁹ Comparable totals for the number of countries indicated.

TABLE 373.—*Hogs: Results of spring and fall pig surveys for the Corn Belt and the United States, 1923-1929*

| Crop | June survey comparisons | | | | December survey comparisons | | | |
|--------------------------|---|----------|---|-------------------|---|----------|---------------------------------------|---------------|
| | Sows for farrow as compared to preceding spring | | Pigs saved | | Sows for farrow as compared to preceding fall | | Pigs saved | |
| | In- tended ¹ | Actual | Com- pared to preceding spring | Per litter | In- tended ¹ | Actual | Com- pared to preceding fall | Per litter |
| | Per cent | Per cent | Per cent | Number | Per cent | Per cent | Per cent | Number |
| Corn Belt, 1923..... | 115.9 | 106.3 | 105.0 | 4.88 | 125.4 | 93.9 | 96.2 | 5.02 |
| United States, 1923..... | 113.1 | 103.9 | 100.9 | 5.02 | 128.3 | 91.3 | 98.2 | 5.07 |
| Corn Belt, 1924..... | 94.6 | 70.7 | 82.9 | 5.02 | 88.6 | 69.4 | 76.6 | 5.47 |
| United States, 1924..... | 98.8 | 78.8 | 80.2 | 5.05 | 94.1 | 71.8 | 77.8 | 5.45 |
| Corn Belt, 1925..... | 89.6 | 80.1 | 89.4 | 5.78 | 100.9 | 95.4 | 87.8 | 5.72 |
| United States, 1925..... | 94.3 | 81.2 | 91.3 | 5.79 | 104.5 | 94.6 | 88.1 | 5.73 |
| Corn Belt, 1926..... | 111.1 | 103.5 | 99.5 | 5.84 | 126.4 | 104.8 | 104.3 | 5.68 |
| United States, 1926..... | 111.9 | 101.7 | 98.8 | 5.58 | 139.0 | 102.4 | 103.0 | 5.77 |
| Corn Belt, 1927..... | 108.9 | 101.8 | 101.8 | 5.55 | 123.1 | 100.3 | 111.3 | 5.89 |
| United States, 1927..... | 113.2 | 103.0 | 103.5 | 5.62 | 129.9 | 110.2 | 111.0 | 5.81 |
| Corn Belt, 1928..... | 101.3 | 91.0 | 93.0 | ² 5.64 | 109.1 | 96.0 | 95.4 | 6.04 |
| United States, 1928..... | 105.8 | 92.3 | 92.9 | ² 5.63 | 111.7 | 93.3 | 94.7 | 5.96 |
| Corn Belt, 1929..... | 103.3 | 92.3 | 93.9 | 5.72 | 117.1 | 102.8 | 103.7 | 6.06 |
| United States, 1929..... | 105.4 | 90.3 | 91.6 | 5.67 | 117.8 | 99.8 | 98.1 | 6.02 |
| Corn Belt, 1930..... | 105.1 | | | | | | | |
| United States, 1930..... | 106.0 | | | | | | | |

Bureau of Agricultural Economics.

¹ As shown by preceding survey.

² Revised, June, 1929.

TABLE 374.—Hogs: Results of spring and fall pig surveys, by States, 1928-29

| State and division | Sows farrowed | | | | Pigs saved per litter | | | | Intended farrowings | | | |
|---------------------|--|--------|--------------------------------------|--------|-----------------------|------|------------|------|---|--------|---|--------|
| | Spring, 1928, compared with spring, 1927 | | Fall, 1928, compared with fall, 1927 | | Spring, 1928 | | Fall, 1928 | | In fall, 1928, compared with actual, 1927 | | In spring, 1929, compared with actual, 1928 | |
| | P. ct. | P. ct. | P. ct. | P. ct. | No. | No. | No. | No. | P. ct. | P. ct. | P. ct. | P. ct. |
| Maine..... | 75.3 | 79.1 | 67.1 | 95.5 | 6.2 | 6.8 | 6.6 | 6.8 | 94.6 | 92.1 | 100.7 | 89.2 |
| New Hampshire..... | 78.9 | 103.7 | 62.5 | 112.1 | 6.5 | 6.1 | 6.4 | 7.1 | 84.9 | 91.7 | 132.2 | 92.0 |
| Vermont..... | 84.5 | 89.5 | 79.9 | 80.4 | 7.1 | 7.2 | 7.3 | 7.4 | 93.6 | 81.2 | 113.4 | 107.6 |
| Massachusetts..... | 133.6 | 115.1 | 93.8 | 101.0 | 5.8 | 6.8 | 5.2 | 8.1 | 70.3 | 114.7 | 89.8 | 102.4 |
| Rhode Island..... | 133.3 | 89.0 | 74.4 | 111.1 | 6.3 | 6.5 | 6.4 | 6.0 | 244.4 | 91.1 | 110.8 | 144.1 |
| Connecticut..... | 118.3 | 61.7 | 68.8 | 132.0 | 6.4 | 7.8 | 7.2 | 6.6 | 112.5 | 77.2 | 117.9 | 158.3 |
| New York..... | 82.2 | 78.1 | 70.4 | 90.7 | 6.5 | 7.3 | 7.2 | 6.8 | 86.9 | 92.4 | 101.9 | 89.5 |
| New Jersey..... | 89.1 | 84.4 | 88.2 | 83.6 | 5.8 | 5.1 | 5.9 | 6.0 | 100.4 | 86.7 | 115.6 | 96.9 |
| Pennsylvania..... | 85.4 | 91.6 | 75.4 | 94.7 | 6.0 | 6.3 | 6.7 | 6.5 | 103.6 | 95.0 | 99.4 | 97.5 |
| North Atlantic..... | 85.0 | 91.1 | 75.0 | 93.3 | 6.00 | 6.75 | 7.00 | 6.67 | 95.2 | 95.2 | 98.9 | 96.1 |
| Ohio..... | 95.2 | 92.6 | 91.7 | 91.7 | 6.1 | 6.5 | 6.7 | 6.5 | 108.8 | 98.6 | 106.3 | 98.5 |
| Indiana..... | 91.7 | 92.9 | 89.8 | 89.2 | 6.0 | 6.3 | 6.3 | 6.3 | 109.7 | 98.6 | 103.7 | 100.6 |
| Illinois..... | 90.6 | 98.7 | 88.6 | 103.3 | 5.8 | 6.2 | 5.9 | 6.2 | 105.1 | 106.8 | 115.2 | 107.0 |
| Michigan..... | 77.9 | 83.7 | 79.0 | 89.9 | 6.6 | 6.7 | 6.8 | 6.8 | 97.8 | 92.7 | 102.2 | 91.1 |
| Wisconsin..... | 82.1 | 84.6 | 90.2 | 105.6 | 6.3 | 6.3 | 6.3 | 6.4 | 86.7 | 101.5 | 127.0 | 107.5 |
| Minnesota..... | 80.7 | 90.5 | 94.7 | 108.2 | 5.6 | 5.8 | 5.7 | 5.9 | 103.3 | 102.9 | 136.1 | 106.5 |
| Iowa..... | 98.8 | 107.4 | 92.9 | 123.6 | 5.5 | 5.8 | 5.5 | 5.7 | 112.4 | 105.0 | 120.0 | 107.2 |
| Missouri..... | 100.7 | 96.4 | 93.7 | 86.7 | 16.0 | 6.1 | 5.8 | 6.2 | 112.1 | 104.8 | 109.7 | 97.1 |
| North Dakota..... | 90.6 | 97.2 | 98.3 | 116.4 | 5.8 | 5.6 | 5.5 | 5.7 | 147.0 | 120.4 | 295.9 | 104.7 |
| South Dakota..... | 92.5 | 87.0 | 90.7 | 97.3 | 5.3 | 5.6 | 5.4 | 5.3 | 116.5 | 102.7 | 166.3 | 110.7 |
| Nebraska..... | 98.8 | 80.6 | 91.4 | 106.3 | 5.0 | 5.3 | 5.3 | 5.9 | 110.9 | 99.3 | 114.3 | 104.8 |
| Kansas..... | 97.4 | 101.4 | 101.7 | 106.0 | 5.8 | 6.0 | 5.5 | 6.0 | 123.9 | 110.2 | 119.0 | 106.3 |
| North Central..... | 93.4 | 96.0 | 92.2 | 103.0 | 5.65 | 6.04 | 5.71 | 6.04 | 109.5 | 103.8 | 118.3 | 105.1 |
| Corn Belt..... | 91.0 | 96.0 | 92.3 | 102.8 | 5.64 | 6.04 | 5.72 | 6.05 | 109.1 | 103.3 | 117.1 | 105.1 |
| Delaware..... | 86.1 | 98.1 | 100.7 | 88.9 | 6.5 | 6.1 | 6.6 | 6.9 | 117.3 | 107.1 | 113.4 | 109.0 |
| Maryland..... | 98.5 | 103.5 | 103.5 | 94.0 | 6.3 | 6.0 | 6.0 | 6.0 | 105.6 | 101.1 | 110.2 | 98.7 |
| Virginia..... | 96.6 | 89.0 | 77.8 | 96.7 | 6.2 | 6.6 | 6.6 | 6.7 | 102.3 | 98.2 | 106.7 | 101.7 |
| West Virginia..... | 78.3 | 85.4 | 88.4 | 93.8 | 6.9 | 6.0 | 7.0 | 6.7 | 98.7 | 98.9 | 135.8 | 93.0 |
| North Carolina..... | 100.0 | 96.4 | 80.8 | 83.4 | 5.8 | 5.4 | 5.4 | 5.8 | 115.8 | 112.2 | 104.0 | 104.1 |
| South Carolina..... | 97.8 | 79.7 | 89.8 | 89.9 | 5.2 | 5.2 | 4.8 | 5.7 | 127.3 | 107.1 | 147.1 | 122.0 |
| Georgia..... | 109.0 | 92.7 | 90.1 | 87.7 | 5.4 | 5.5 | 5.7 | 5.7 | 133.7 | 122.7 | 132.8 | 125.4 |
| Florida..... | 92.1 | 98.4 | 89.8 | 86.4 | 5.2 | 5.2 | 5.1 | 5.1 | 119.6 | 127.0 | 114.1 | 132.6 |
| South Atlantic..... | 100.7 | 91.4 | 85.7 | 84.5 | 5.57 | 5.71 | 5.57 | 5.95 | 118.7 | 114.4 | 120.4 | 115.7 |
| Kentucky..... | 82.2 | 67.9 | 73.0 | 83.2 | 6.2 | 6.4 | 6.4 | 6.4 | 96.9 | 89.0 | 101.8 | 96.1 |
| Tennessee..... | 89.5 | 89.4 | 79.5 | 82.4 | 5.9 | 6.2 | 6.2 | 6.5 | 105.6 | 99.0 | 111.4 | 106.4 |
| Alabama..... | 108.9 | 84.1 | 89.4 | 87.2 | 5.1 | 4.6 | 5.4 | 5.3 | 125.7 | 112.4 | 125.8 | 116.6 |
| Mississippi..... | 91.5 | 82.5 | 84.5 | 92.2 | 5.4 | 5.2 | 5.4 | 5.5 | 127.0 | 120.9 | 128.3 | 129.4 |
| Arkansas..... | 84.5 | 77.0 | 73.2 | 74.3 | 15.0 | 5.1 | 5.1 | 5.3 | 113.4 | 117.6 | 132.8 | 107.1 |
| Louisiana..... | 84.4 | 80.5 | 88.2 | 81.4 | 5.0 | 5.2 | 4.8 | 5.3 | 138.9 | 143.8 | 151.6 | 114.9 |
| Oklahoma..... | 93.6 | 88.9 | 78.1 | 83.9 | 5.4 | 5.6 | 5.7 | 6.0 | 129.0 | 100.9 | 120.4 | 106.3 |
| Texas..... | 99.5 | 78.1 | 70.1 | 73.5 | 5.4 | 5.7 | 5.2 | 5.5 | 138.1 | 106.2 | 109.2 | 103.1 |
| South Central..... | 92.3 | 80.8 | 78.3 | 81.5 | 5.43 | 5.64 | 5.30 | 5.82 | 110.0 | 108.9 | 117.6 | 108.6 |
| Montana..... | 107.0 | 121.1 | 95.0 | 104.2 | 5.7 | 5.7 | 6.0 | 6.5 | 151.0 | 121.1 | 132.1 | 91.6 |
| Idaho..... | 85.2 | 82.1 | 84.3 | 80.4 | 5.8 | 6.1 | 6.1 | 6.2 | 88.4 | 98.1 | 130.1 | 96.4 |
| Wyoming..... | 106.5 | 116.3 | 113.4 | 135.7 | 5.9 | 5.0 | 3.4 | 5.1 | 191.5 | 121.1 | 112.2 | 113.0 |
| Colorado..... | 109.8 | 124.6 | 98.0 | 116.6 | 5.6 | 5.5 | 5.3 | 5.6 | 141.8 | 129.8 | 131.4 | 113.5 |
| New Mexico..... | 114.7 | 103.0 | 96.4 | 81.7 | 4.4 | 5.2 | 5.4 | 6.0 | 178.5 | 119.2 | 143.6 | 106.5 |
| Arizona..... | 142.0 | 95.1 | 117.1 | 87.4 | 7.3 | 5.2 | 5.6 | 6.1 | 127.8 | 94.1 | 121.6 | 118.8 |
| Utah..... | 112.4 | 92.2 | 70.0 | 98.4 | 6.1 | 6.5 | 6.3 | 6.3 | 174.3 | 123.0 | 144.1 | 147.0 |
| Nevada..... | 116.3 | 101.0 | 96.2 | 95.5 | 7.0 | 6.6 | 5.4 | 6.2 | 150.0 | 155.4 | 142.4 | 126.5 |
| Washington..... | 117.6 | 105.3 | 89.2 | 88.3 | 6.5 | 6.5 | 6.1 | 6.8 | 124.0 | 93.5 | 106.2 | 93.5 |
| Oregon..... | 111.0 | 97.7 | 89.5 | 96.2 | 6.3 | 6.4 | 7.0 | 7.1 | 130.6 | 98.1 | 101.3 | 109.3 |
| California..... | 119.5 | 94.7 | 84.6 | 84.1 | 16.0 | 6.1 | 6.2 | 5.9 | 20.2 | 111.1 | 110.4 | 96.9 |
| Far Western..... | 105.8 | 103.7 | 93.0 | 100.4 | 6.00 | 5.92 | 5.67 | 6.14 | 112.6 | 113.7 | 119.4 | 103.2 |
| United States..... | 92.3 | 93.3 | 90.3 | 98.1 | 5.63 | 5.96 | 5.67 | 6.02 | 111.7 | 105.4 | 117.8 | 106.0 |

Bureau of Agricultural Economics.

Revised June, 1929.

TABLE 375.—*Hogs: Receipts at principal public stockyards and all public stockyards, 1909-1929*

| Year | Chi- cago | Den- ver | East St. Louis | Fort Worth | Kan- sas City | Oma- ha | St. Joseph | South St. Paul | Sioux City | Total 9 mar- kets ¹ | All other stock- yards report- ing | Total all stock- yards repor- ing |
|-----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------------------------------|---|--|
| | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> |
| 1909..... | 6,619 | 242 | 2,473 | 868 | 3,093 | 2,135 | 1,694 | 725 | 1,077 | 18,926 | (²) | (²) |
| 1910..... | 5,587 | 187 | 2,054 | 541 | 2,086 | 1,804 | 1,353 | 836 | 1,044 | 15,582 | (²) | (²) |
| 1911..... | 7,103 | 220 | 3,124 | 556 | 3,108 | 2,367 | 1,922 | 911 | 1,349 | 20,720 | (²) | (²) |
| 1912..... | 7,181 | 222 | 2,530 | 388 | 2,523 | 2,886 | 1,970 | 984 | 1,698 | 20,382 | (²) | (²) |
| 1913..... | 7,571 | 247 | 2,584 | 404 | 2,568 | 2,543 | 1,869 | 1,257 | 1,533 | 20,576 | (²) | (²) |
| 1914..... | 6,618 | 256 | 2,559 | 515 | 2,265 | 2,259 | 1,725 | 1,590 | 1,257 | 19,044 | (²) | (²) |
| 1915..... | 7,652 | 344 | 2,592 | 464 | 2,531 | 2,643 | 1,698 | 2,155 | 1,761 | 21,840 | 14,373 | 36,213 |
| 1916..... | 9,188 | 467 | 3,057 | 968 | 2,979 | 3,117 | 2,199 | 2,075 | 2,131 | 26,781 | 16,484 | 43,265 |
| 1917..... | 7,169 | 352 | 2,706 | 1,062 | 2,277 | 2,797 | 1,920 | 1,928 | 2,149 | 22,360 | 15,682 | 38,042 |
| 1918..... | 8,614 | 384 | 3,256 | 702 | 3,328 | 3,430 | 2,351 | 2,061 | 2,421 | 26,607 | 18,256 | 44,863 |
| 1919..... | 8,072 | 368 | 3,651 | 588 | 3,141 | 3,179 | 2,126 | 2,190 | 2,322 | 26,237 | 18,232 | 44,469 |
| 1920..... | 7,526 | 341 | 3,399 | 413 | 2,466 | 2,708 | 1,914 | 2,247 | 2,173 | 23,187 | 18,934 | 42,121 |
| 1921..... | 8,148 | 334 | 3,330 | 382 | 2,205 | 2,665 | 1,785 | 2,210 | 1,739 | 22,798 | 18,303 | 41,101 |
| 1922..... | 8,156 | 395 | 3,606 | 510 | 2,655 | 2,839 | 2,061 | 2,523 | 1,856 | 24,601 | 19,467 | 44,068 |
| 1923..... | 10,460 | 495 | 4,831 | 486 | 3,615 | 3,649 | 2,457 | 3,338 | 2,989 | 32,320 | 23,010 | 55,330 |
| 1924..... | 10,443 | 569 | 4,580 | 392 | 2,933 | 3,978 | 2,234 | 3,751 | 3,732 | 32,612 | 22,802 | 55,414 |
| 1925..... | 7,996 | 467 | 3,512 | 312 | 2,067 | 3,355 | 1,673 | 3,637 | 3,396 | 26,415 | 17,514 | 43,929 |
| 1926..... | 7,093 | 497 | 3,506 | 217 | 2,036 | 2,647 | 1,462 | 3,451 | 2,475 | 23,414 | 16,358 | 39,772 |
| 1927..... | 7,724 | 457 | 3,710 | 338 | 1,904 | 2,631 | 1,425 | 3,105 | 2,322 | 23,616 | 17,795 | 41,411 |
| 1928..... | 8,530 | 567 | 4,036 | 432 | 2,391 | 3,179 | 1,724 | 2,902 | 2,754 | 26,524 | 20,003 | 46,527 |
| 1929..... | 8,193 | 539 | 3,865 | 402 | 2,476 | 3,166 | 1,627 | 2,869 | 2,313 | 25,450 | 18,647 | 44,097 |

Bureau of Agricultural Economics. Prior to 1915 receipts compiled from yearbooks of stockyard companies; subsequent figures compiled from data of the livestock and meat reporting service of the bureau. Receipts, 1900-1908, are available in 1924 Yearbook, p. 902, Table 500.

¹ Total of the rounded detail figures.

² Figures not available prior to 1915.

TABLE 376.—*Hogs: Receipts at all public stockyards, 1915-1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> | <i>Thou- sands</i> |
| 1915 ¹ | 3,959 | 3,449 | 3,199 | 2,487 | 2,768 | 2,874 | 2,368 | 2,024 | 1,966 | 2,457 | 3,728 | 4,934 | 36,213 |
| 1916 ¹ | 5,309 | 4,233 | 3,489 | 2,852 | 3,332 | 3,054 | 2,524 | 2,634 | 2,386 | 3,040 | 4,873 | 4,939 | 43,265 |
| 1917..... | 5,084 | 3,933 | 3,369 | 2,961 | 3,264 | 2,791 | 2,563 | 1,853 | 1,615 | 2,676 | 3,941 | 3,992 | 38,042 |
| 1918..... | 4,444 | 4,486 | 4,424 | 3,096 | 3,345 | 2,979 | 3,099 | 2,467 | 2,376 | 3,399 | 4,594 | 5,554 | 44,863 |
| 1919..... | 5,855 | 4,412 | 3,643 | 3,048 | 3,831 | 3,773 | 2,974 | 2,095 | 2,397 | 3,121 | 3,740 | 4,980 | 44,469 |
| 1920..... | 5,262 | 3,422 | 3,940 | 3,024 | 4,210 | 3,709 | 2,811 | 2,491 | 2,391 | 2,789 | 3,872 | 4,200 | 42,121 |
| 1921..... | 4,700 | 4,009 | 3,386 | 3,229 | 3,328 | 3,579 | 2,727 | 2,656 | 2,655 | 3,214 | 3,687 | 3,931 | 41,101 |
| 1922..... | 4,278 | 3,613 | 3,411 | 3,067 | 3,737 | 3,776 | 2,980 | 3,037 | 3,062 | 3,082 | 4,421 | 5,004 | 44,068 |
| 1923..... | 5,306 | 4,492 | 4,927 | 4,318 | 4,524 | 4,204 | 4,181 | 3,714 | 3,607 | 4,816 | 5,416 | 5,825 | 55,330 |
| 1924..... | 6,253 | 5,335 | 4,833 | 4,374 | 4,321 | 4,296 | 4,091 | 3,197 | 3,216 | 3,900 | 4,904 | 6,804 | 55,414 |
| 1925..... | 6,105 | 4,558 | 3,528 | 3,247 | 3,283 | 3,507 | 2,798 | 2,549 | 2,741 | 3,390 | 3,843 | 4,380 | 43,929 |
| 1926..... | 4,304 | 3,372 | 3,579 | 3,135 | 3,037 | 3,143 | 2,854 | 2,804 | 2,819 | 3,261 | 3,554 | 3,910 | 39,772 |
| 1927..... | 4,252 | 3,308 | 3,754 | 3,142 | 3,613 | 3,775 | 3,046 | 3,042 | 2,565 | 3,039 | 3,666 | 4,209 | 41,411 |
| 1928..... | 5,306 | 5,267 | 4,639 | 3,483 | 3,723 | 3,548 | 2,924 | 2,523 | 2,600 | 3,660 | 4,075 | 4,773 | 46,527 |
| 1929..... | 5,133 | 4,000 | 3,436 | 3,682 | 3,431 | 3,275 | 3,297 | 2,964 | 3,089 | 3,701 | 3,933 | 4,266 | 44,097 |

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau.

¹ Complete information for 1915 and 1916, particularly on disposition of stock, is not obtainable from many of these markets.

NOTE.—A table similar to Table 378, 1928 Yearbook, receipts, local slaughter, and stocker and feeder shipments of hogs, is omitted.

TABLE 377.—*Hogs: Monthly average live weight, Chicago, 1909–1929*

| Year beginning October | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Average Oct.–Mar. ¹ | Apr. | May | June | July | Aug. | Sept. | Average Apr.–Sept. ¹ |
|------------------------|------|------|------|------|------|------|--------------------------------|------|-----|------|------|------|-------|---------------------------------|
| 1909..... | 227 | 225 | 214 | 210 | 213 | 218 | 218 | 227 | 239 | 242 | 246 | 255 | 259 | 245 |
| 1910..... | 253 | 232 | 224 | 226 | 230 | 239 | 234 | 241 | 242 | 236 | 233 | 239 | 224 | 236 |
| 1911..... | 212 | 208 | 213 | 212 | 217 | 218 | 213 | 227 | 282 | 235 | 239 | 240 | 235 | 235 |
| 1912..... | 226 | 222 | 223 | 226 | 230 | 240 | 228 | 242 | 242 | 244 | 243 | 233 | 222 | 238 |
| 1913..... | 209 | 207 | 213 | 216 | 224 | 233 | 217 | 233 | 236 | 237 | 244 | 248 | 242 | 240 |
| 1914..... | 229 | 218 | 226 | 223 | 224 | 231 | 225 | 233 | 233 | 231 | 238 | 246 | 235 | 236 |
| 1915..... | 204 | 187 | 190 | 195 | 204 | 214 | 199 | 219 | 220 | 226 | 231 | 232 | 223 | 225 |
| 1916..... | 210 | 195 | 193 | 199 | 204 | 208 | 202 | 213 | 217 | 225 | 232 | 233 | 231 | 225 |
| 1917..... | 212 | 209 | 211 | 216 | 231 | 238 | 220 | 242 | 238 | 235 | 243 | 243 | 247 | 241 |
| 1918..... | 233 | 226 | 223 | 228 | 232 | 230 | 229 | 230 | 232 | 233 | 242 | 251 | 254 | 240 |
| 1919..... | 237 | 220 | 224 | 229 | 239 | 244 | 235 | 248 | 245 | 243 | 252 | 258 | 258 | 251 |
| 1920..... | 247 | 234 | 230 | 234 | 234 | 241 | 237 | 242 | 239 | 241 | 250 | 259 | 262 | 249 |
| 1921..... | 243 | 225 | 226 | 231 | 236 | 244 | 234 | 246 | 244 | 247 | 259 | 268 | 265 | 255 |
| 1922..... | 243 | 231 | 234 | 239 | 241 | 247 | 239 | 249 | 242 | 242 | 250 | 253 | 254 | 248 |
| 1923..... | 247 | 234 | 231 | 227 | 230 | 237 | 234 | 239 | 239 | 241 | 251 | 255 | 254 | 246 |
| 1924..... | 235 | 220 | 214 | 220 | 222 | 229 | 223 | 235 | 236 | 238 | 249 | 266 | 253 | 244 |
| 1925..... | 242 | 228 | 225 | 231 | 235 | 245 | 234 | 244 | 247 | 255 | 271 | 281 | 267 | 261 |
| 1926..... | 232 | 217 | 220 | 226 | 229 | 240 | 227 | 239 | 243 | 248 | 257 | 265 | 261 | 252 |
| 1927..... | 235 | 215 | 217 | 225 | 230 | 235 | 226 | 233 | 234 | 239 | 251 | 257 | 251 | 244 |
| 1928..... | 247 | 238 | 231 | 228 | 228 | 238 | 235 | 241 | 239 | 247 | 257 | 265 | 250 | 251 |
| 1929..... | 242 | 223 | 224 | | | | | | | | | | | |

Bureau of Agricultural Economics. Figures for 1909–1919 compiled from Chicago Drovers Journal Yearbook; subsequent figures from data of the livestock and meat reporting service of the bureau, which are the weighted average of packer and shipper purchases. Data for 1900–1908 are available in 1924 Yearbook, p. 906, Table 506.

¹ Simple average.

TABLE 378.—*Feeder hogs, inspected: Shipments from public stockyards, 1920–1928*

| Origin and destination | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|---------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> | <i>Thou-</i> |
| <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> |
| Market origin: | | | | | | | | | |
| Denver, Colo..... | 8 | 4 | 3 | 12 | 22 | 24 | 27 | 37 | 8 |
| East St. Louis, Ill..... | 40 | 30 | 41 | 33 | 9 | 13 | 14 | 16 | 11 |
| Fort Worth, Tex..... | 29 | 45 | 38 | 24 | 9 | 13 | 14 | 16 | 11 |
| Indianapolis, Ind..... | 17 | 18 | 17 | 16 | 15 | 14 | 22 | 14 | 14 |
| Kansas City, Kans..... | 145 | 78 | 151 | 265 | 119 | 55 | 97 | 86 | 95 |
| Los Angeles, Calif..... | | | 2 | 13 | 1 | 5 | 1 | 2 | 2 |
| Louisville, Ky..... | 10 | 11 | 18 | 2 | 2 | 2 | 3 | 6 | 4 |
| Oklahoma City, Okla..... | 32 | 10 | 20 | 28 | 10 | 10 | 10 | 10 | 16 |
| Omaha, Neb..... | 11 | 11 | 7 | 15 | 21 | 15 | 15 | 36 | 38 |
| Portland, Oreg..... | 11 | 11 | 17 | 19 | 20 | 18 | 20 | 16 | 19 |
| Sioux City, Iowa..... | 22 | 12 | 7 | 10 | 5 | 5 | 13 | 6 | 3 |
| South St. Joseph, Mo..... | 5 | 1 | | 2 | 2 | 15 | 23 | 20 | 26 |
| South St. Paul, Minn..... | 105 | 97 | 112 | 136 | 118 | 157 | 357 | 301 | 197 |
| Wichita, Kans..... | 25 | 11 | 16 | 31 | 27 | 14 | 5 | 7 | 7 |
| All other inspected..... | 66 | 36 | 44 | 36 | 34 | 42 | 53 | 70 | 70 |
| Total..... | 530 | 371 | 493 | 642 | 414 | 396 | 667 | 636 | 540 |
| State destination: | | | | | | | | | |
| California..... | | | 9 | 17 | 2 | 4 | 3 | 4 | 4 |
| Colorado..... | | | | 10 | 6 | 7 | 6 | 7 | 7 |
| Illinois..... | 61 | 40 | 63 | 96 | 44 | 47 | 106 | 64 | 41 |
| Indiana..... | 29 | 28 | 47 | 25 | 20 | 34 | 101 | 62 | 31 |
| Iowa..... | 133 | 76 | 120 | 176 | 74 | 33 | 75 | 78 | 75 |
| Kansas..... | 44 | 32 | 29 | 26 | 17 | 18 | 16 | 28 | 55 |
| Kentucky..... | 6 | 11 | | | | | 11 | 24 | 6 |
| Michigan..... | | | 10 | 10 | 15 | 20 | 31 | 23 | 17 |
| Minnesota..... | 26 | 25 | 34 | 34 | 40 | 40 | 51 | 42 | 41 |
| Missouri..... | 64 | 36 | 46 | 70 | 37 | 32 | 46 | 56 | 47 |
| Nebraska..... | 24 | 15 | 23 | 63 | 34 | 24 | 20 | 85 | 87 |
| Ohio..... | 11 | 12 | 11 | 11 | 8 | 23 | 77 | 35 | 6 |
| Oklahoma..... | 37 | 24 | 24 | 14 | 11 | 10 | 10 | 13 | 14 |
| Oregon..... | 10 | 10 | 12 | 18 | 19 | 17 | 19 | 15 | 18 |
| Tennessee..... | | | | 6 | 5 | 6 | 11 | 6 | 5 |
| Texas..... | 22 | 12 | 11 | 19 | 26 | 23 | 27 | 18 | 14 |
| All other..... | 63 | 50 | 54 | 47 | 56 | 58 | 57 | 76 | 73 |
| Total..... | 530 | 371 | 493 | 642 | 414 | 396 | 667 | 636 | 540 |

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

¹ Includes other shipments as follows: To Alaska, 543 head in 1923, 785 head in 1924, 577 head in 1925, 718 head in 1926, and 869 head in 1927; to Hawaii, 412 head in 1923.

TABLE 379.—Feeder hogs, inspected: Shipments from public stockyards, by months, 1929

| Origin and destination | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|
| Market origin: | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number |
| Denver, Colo. | 856 | 639 | 450 | 479 | 272 | 226 | 446 | 281 | 729 | 501 | 1,038 | 848 | 5,780 |
| East St. Louis, Ill. | 1,170 | 2,205 | 2,844 | 5,178 | 2,494 | 1,963 | 2,225 | 2,345 | 2,043 | 1,654 | 1,385 | 853 | 26,014 |
| Fort Worth, Tex. | 631 | 585 | 3,452 | 2,629 | 1,050 | 1,220 | 748 | 1,223 | 820 | 418 | 600 | 390 | 13,861 |
| Indianapolis, Ind. | 868 | 322 | 522 | 865 | 1,269 | 1,493 | 576 | 317 | 517 | 3,463 | 5,838 | 263 | 7,652 |
| Kansas City, Kans. | 6,346 | 9,796 | 20,144 | 18,740 | 8,032 | 10,968 | 4,303 | 6,051 | 4,846 | 3,463 | 84 | 4,095 | 105,332 |
| Los Angeles, Calif. | 34 | 34 | 335 | 401 | 335 | 4 | 171 | 233 | 173 | 222 | 84 | 307 | 1,964 |
| Oklahoma City, Okla. | 1,450 | 1,323 | 1,970 | 2,632 | 2,496 | 1,548 | 1,730 | 1,346 | 767 | 906 | 845 | 1,549 | 15,762 |
| Omaha, Neb. | 2,619 | 2,636 | 3,580 | 3,580 | 2,496 | 1,961 | 1,961 | 1,251 | 956 | 1,220 | 1,174 | 1,755 | 36,360 |
| Portland, Oreg. | 1,332 | 1,190 | 2,111 | 1,644 | 1,896 | 1,372 | 1,087 | 1,919 | 1,841 | 2,022 | 1,933 | 1,213 | 20,170 |
| Stour City, Iowa | 274 | 11 | 112 | 167 | 76 | 58 | 67 | 80 | 227 | 144 | 139 | 26 | 1,401 |
| South St. Joseph, Mo. | 1,337 | 1,843 | 1,722 | 1,334 | 1,442 | 1,612 | 1,296 | 1,909 | 889 | 680 | 1,186 | 1,236 | 16,008 |
| South St. Paul, Minn. | 10,247 | 10,616 | 13,244 | 11,625 | 11,771 | 9,632 | 6,248 | 8,783 | 15,030 | 24,870 | 23,953 | 11,472 | 187,496 |
| Wichita, Kans. | 292 | 368 | 164 | 368 | 105 | 70 | 70 | 739 | 474 | 5,227 | 145 | 536 | 3,218 |
| All other inspected | 5,199 | 4,635 | 7,176 | 10,339 | 7,869 | 6,142 | 5,398 | 5,739 | 4,680 | 4,917 | 4,917 | 4,738 | 72,009 |
| Total | 32,658 | 35,811 | 58,491 | 59,981 | 40,791 | 38,994 | 25,276 | 31,475 | 34,227 | 42,736 | 42,322 | 29,355 | 472,117 |
| State destination: | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number | Number |
| California | 34 | 500 | 257 | 401 | 335 | 4 | 171 | 233 | 173 | 222 | 84 | 307 | 2,221 |
| Colorado | 1,007 | 1,902 | 3,622 | 6,814 | 3,150 | 2,525 | 2,828 | 1,708 | 2,782 | 3,640 | 3,383 | 848 | 8,831 |
| Illinois | 2,500 | 887 | 1,349 | 3,564 | 3,265 | 2,750 | 1,429 | 1,819 | 939 | 1,505 | 1,329 | 2,225 | 37,069 |
| Indiana | 5,466 | 4,991 | 10,797 | 11,776 | 7,762 | 3,322 | 2,959 | 4,095 | 4,149 | 4,332 | 5,546 | 4,895 | 20,062 |
| Iowa | 5,545 | 3,791 | 5,894 | 6,165 | 2,789 | 3,290 | 1,238 | 2,086 | 1,649 | 1,965 | 3,174 | 2,276 | 74,493 |
| Kansas | 540 | 3,162 | 1,614 | 1,951 | 1,271 | 2,048 | 1,938 | 1,732 | 745 | 6,817 | 1,496 | 141 | 36,542 |
| Michigan | 1,885 | 2,395 | 3,545 | 3,792 | 4,447 | 4,050 | 2,277 | 3,508 | 4,715 | 6,817 | 7,581 | 4,683 | 19,941 |
| Minnesota | 2,879 | 5,324 | 10,455 | 7,829 | 4,035 | 4,298 | 1,879 | 2,280 | 1,878 | 1,483 | 1,920 | 1,293 | 45,578 |
| Missouri | 2,248 | 3,573 | 6,614 | 3,794 | 2,366 | 2,271 | 1,983 | 1,453 | 1,369 | 1,951 | 3,373 | 1,757 | 32,812 |
| Nebraska | 350 | 291 | 184 | 523 | 579 | 484 | 418 | 697 | 392 | 756 | 1,917 | 1,002 | 7,623 |
| Ohio | 1,304 | 1,235 | 1,981 | 1,981 | 674 | 1,141 | 750 | 1,192 | 767 | 616 | 546 | 1,385 | 12,914 |
| Oklahoma | 1,024 | 1,066 | 2,024 | 1,509 | 1,611 | 1,267 | 1,000 | 1,791 | 1,543 | 2,256 | 1,697 | 1,105 | 17,913 |
| Oregon | 552 | 467 | 344 | 483 | 452 | 263 | 371 | 233 | 233 | 722 | 1,261 | 627 | 5,631 |
| Tennessee | 1,622 | 895 | 1,772 | 1,438 | 887 | 1,122 | 876 | 1,451 | 960 | 874 | 1,163 | 1,018 | 13,956 |
| Texas | 7,154 | 5,214 | 8,335 | 7,339 | 6,643 | 5,838 | 4,303 | 7,735 | 11,062 | 11,363 | 8,842 | 4,865 | 89,491 |
| All other | 132,658 | 35,811 | 58,491 | 59,981 | 40,791 | 38,994 | 25,276 | 31,475 | 34,227 | 42,736 | 42,322 | 29,355 | 472,117 |

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

* Includes 220 head shipped to Cuba.

* Includes 283 head shipped to Alaska.

* Includes 7 head shipped to Alaska.

* Includes 3 head shipped to Alaska.

TABLE 380.—*Hogs: Estimated price per 100 pounds received by producers in the United States, 1910-1929*

| Year beginning November | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Weight- ed aver- age |
|----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------------------|
| | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> |
| 1910..... | 7.61 | 7.16 | 7.44 | 7.04 | 6.74 | 6.17 | 5.72 | 5.66 | 5.92 | 6.54 | 6.53 | 6.09 | 6.61 |
| 1911..... | 5.86 | 5.72 | 5.74 | 5.79 | 5.94 | 6.78 | 6.79 | 6.65 | 6.64 | 7.11 | 7.47 | 7.70 | 6.43 |
| 1912..... | 7.06 | 6.89 | 6.77 | 7.17 | 7.62 | 7.94 | 7.45 | 7.61 | 7.81 | 7.79 | 7.68 | 7.60 | 7.39 |
| 1913..... | 7.33 | 7.16 | 7.45 | 7.75 | 7.80 | 7.80 | 7.60 | 7.43 | 7.72 | 8.11 | 8.11 | 7.43 | 7.60 |
| 1914..... | 7.00 | 6.67 | 6.57 | 6.34 | 6.33 | 6.48 | 6.77 | 6.80 | 6.84 | 6.61 | 6.79 | 7.18 | 6.69 |
| 1915..... | 6.35 | 6.02 | 6.32 | 7.07 | 7.86 | 8.21 | 8.37 | 8.21 | 8.40 | 8.61 | 9.22 | 8.67 | 7.61 |
| 1916..... | 8.74 | 8.79 | 9.16 | 10.33 | 12.32 | 13.61 | 13.72 | 13.50 | 13.35 | 14.24 | 15.69 | 16.15 | 12.10 |
| 1917..... | 15.31 | 15.73 | 15.26 | 15.03 | 15.58 | 15.76 | 15.84 | 15.37 | 15.58 | 16.89 | 17.50 | 16.50 | 15.78 |
| 1918..... | 15.92 | 15.82 | 15.69 | 15.53 | 16.13 | 17.39 | 18.00 | 17.80 | 19.22 | 19.30 | 15.81 | 13.88 | 16.60 |
| 1919..... | 13.36 | 12.66 | 13.36 | 13.62 | 13.59 | 13.73 | 13.44 | 13.18 | 13.65 | 13.59 | 13.98 | 13.57 | 13.43 |
| 1920..... | 11.64 | 8.90 | 8.72 | 8.58 | 9.13 | 7.96 | 7.62 | 7.22 | 8.09 | 8.73 | 7.51 | 7.31 | 8.52 |
| 1921..... | 6.66 | 6.52 | 6.89 | 8.24 | 9.08 | 8.83 | 9.05 | 9.11 | 9.12 | 8.54 | 8.23 | 8.33 | 8.10 |
| 1922..... | 7.78 | 7.68 | 7.77 | 7.65 | 7.52 | 7.45 | 7.13 | 6.37 | 6.68 | 6.85 | 7.81 | 7.23 | 7.34 |
| 1923..... | 6.66 | 6.39 | 6.59 | 6.54 | 6.03 | 6.70 | 6.68 | 6.55 | 6.60 | 8.54 | 8.50 | 9.45 | 7.06 |
| 1924..... | 8.62 | 8.30 | 9.31 | 9.62 | 11.83 | 11.64 | 10.78 | 10.82 | 12.02 | 12.19 | 11.50 | 11.16 | 10.46 |
| 1925..... | 10.66 | 10.51 | 10.99 | 11.76 | 11.65 | 11.49 | 11.97 | 12.80 | 12.69 | 11.66 | 12.07 | 12.06 | 11.63 |
| 1926..... | 11.45 | 10.97 | 10.97 | 11.19 | 10.89 | 10.41 | 9.41 | 8.40 | 8.58 | 9.24 | 9.78 | 10.16 | 10.21 |
| 1927..... | 8.99 | 8.14 | 7.81 | 7.62 | 7.48 | 7.75 | 8.82 | 8.70 | 9.64 | 10.01 | 11.17 | 9.55 | 8.67 |
| 1928..... | 8.51 | 7.93 | 8.18 | 8.88 | 10.00 | 10.20 | 9.96 | 9.80 | 10.33 | 10.28 | 9.53 | 9.10 | 9.27 |
| 1929..... | 8.54 | 8.53 | | | | | | | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by number of hogs Jan. 1, by States; yearly price obtained by weighing monthly prices by Federal inspected slaughter.

TABLE 381.—*Hogs: Average price per 100 pounds at Chicago, by months, 1901-1929*

| Year beginning October | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Simple aver- age |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------------|
| | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> | <i>Dolla.</i> |
| 1901..... | 6.10 | 5.65 | 5.95 | 6.20 | 6.10 | 6.35 | 6.95 | 7.00 | 7.35 | 7.65 | 7.15 | 7.55 | 6.67 |
| 1902..... | 7.00 | 6.30 | 6.29 | 6.40 | 6.75 | 7.30 | 7.20 | 6.45 | 6.00 | 5.55 | 5.45 | 5.85 | 6.37 |
| 1903..... | 5.55 | 4.65 | 4.45 | 4.90 | 5.15 | 5.35 | 5.10 | 4.65 | 5.05 | 5.40 | 5.30 | 5.75 | 5.11 |
| 1904..... | 5.40 | 4.80 | 4.50 | 4.65 | 4.85 | 5.15 | 5.45 | 5.40 | 5.35 | 5.65 | 5.95 | 5.50 | 5.22 |
| 1905..... | 5.25 | 4.85 | 4.90 | 5.40 | 6.00 | 6.30 | 6.55 | 6.45 | 6.55 | 6.65 | 6.25 | 6.25 | 5.95 |
| 1906..... | 6.40 | 6.20 | 6.25 | 6.60 | 7.05 | 6.65 | 6.65 | 6.40 | 6.10 | 6.05 | 6.00 | 6.00 | 6.34 |
| 1907..... | 6.15 | 4.90 | 4.70 | 4.40 | 4.45 | 5.00 | 5.85 | 5.50 | 5.80 | 6.50 | 6.55 | 6.85 | 5.55 |
| 1908..... | 5.95 | 5.80 | 5.65 | 6.10 | 6.35 | 6.70 | 7.20 | 7.30 | 7.65 | 7.85 | 7.75 | 8.20 | 6.88 |
| 1909..... | 7.75 | 8.00 | 8.35 | 8.55 | 9.05 | 10.55 | 9.90 | 9.55 | 9.45 | 8.75 | 8.35 | 8.90 | 8.93 |
| 1910..... | 8.50 | 7.60 | 7.65 | 7.95 | 7.40 | 6.85 | 6.25 | 6.00 | 6.25 | 6.70 | 7.30 | 6.90 | 7.11 |
| 1911..... | 6.45 | 6.30 | 6.40 | 6.25 | 6.20 | 7.10 | 7.80 | 7.65 | 7.50 | 7.65 | 8.25 | 8.35 | 7.17 |
| 1912..... | 8.75 | 7.75 | 7.40 | 7.45 | 8.15 | 8.90 | 9.05 | 8.55 | 8.65 | 9.05 | 8.35 | 8.40 | 8.36 |
| 1913..... | 8.20 | 7.75 | 7.70 | 8.30 | 8.60 | 8.70 | 8.65 | 8.45 | 8.20 | 8.70 | 9.00 | 8.85 | 8.42 |
| 1914..... | 7.65 | 7.50 | 7.10 | 6.90 | 6.80 | 6.75 | 7.30 | 7.60 | 7.60 | 7.25 | 6.90 | 7.25 | 7.22 |
| 1915..... | 7.90 | 6.65 | 6.40 | 7.20 | 8.20 | 9.65 | 9.75 | 9.85 | 9.70 | 9.80 | 10.30 | 10.70 | 8.84 |
| 1916..... | 9.80 | 9.60 | 9.95 | 10.90 | 12.45 | 14.80 | 15.75 | 15.90 | 15.50 | 15.20 | 16.90 | 18.20 | 13.75 |
| 1917..... | 17.15 | 17.40 | 16.85 | 16.30 | 16.65 | 17.10 | 17.45 | 17.45 | 16.60 | 17.75 | 19.00 | 19.65 | 17.45 |
| 1918..... | 17.70 | 17.70 | 17.55 | 17.60 | 17.65 | 19.10 | 20.40 | 20.60 | 20.40 | 21.85 | 20.00 | 17.45 | 19.00 |
| 1919..... | 14.35 | 14.20 | 13.60 | 14.97 | 14.55 | 14.94 | 14.79 | 14.28 | 14.68 | 14.84 | 14.74 | 15.88 | 14.66 |
| 1920..... | 14.17 | 11.83 | 9.55 | 9.41 | 9.42 | 10.00 | 8.50 | 8.35 | 8.19 | 9.69 | 9.26 | 7.61 | 9.66 |
| 1921..... | 7.72 | 7.01 | 6.92 | 8.02 | 9.90 | 10.43 | 10.31 | 10.48 | 10.33 | 9.70 | 8.51 | 8.75 | 9.01 |
| 1922..... | 8.80 | 8.07 | 8.18 | 8.29 | 8.02 | 8.18 | 8.06 | 7.63 | 6.92 | 7.04 | 7.65 | 8.35 | 7.93 |
| 1923..... | 7.42 | 6.85 | 6.87 | 7.10 | 7.06 | 7.35 | 7.36 | 7.34 | 7.04 | 7.68 | 9.38 | 9.57 | 7.58 |
| 1924..... | 9.91 | 8.97 | 9.38 | 10.38 | 11.06 | 13.55 | 12.55 | 12.06 | 12.57 | 13.46 | 12.66 | 12.52 | 11.59 |
| 1925..... | 11.31 | 11.28 | 10.97 | 12.02 | 12.45 | 12.20 | 12.33 | 13.55 | 14.01 | 12.51 | 11.48 | 12.03 | 12.18 |
| 1926..... | 12.72 | 11.80 | 11.57 | 11.93 | 11.73 | 11.28 | 10.69 | 9.59 | 8.78 | 9.05 | 9.03 | 10.22 | 10.70 |
| 1927..... | 10.39 | 8.92 | 8.32 | 8.25 | 8.08 | 8.08 | 9.28 | 9.67 | 9.91 | 10.65 | 11.53 | 11.89 | 9.58 |
| 1928..... | 9.57 | 8.83 | 8.61 | 9.22 | 10.19 | 11.44 | 11.41 | 10.81 | 10.72 | 11.20 | 10.52 | 9.85 | 10.20 |
| 1929..... | 9.38 | 9.06 | 9.34 | | | | | | | | | | |

Bureau of Agricultural Economics. Figures prior to 1920 are general average hog prices as published in the Chicago Drovers Journal Yearbook; subsequent figures compiled from reports of packer and shipper purchases; such purchases do not include pigs, boars, stags, extremely rough sows, or cripples.

TABLE 382.—Hogs: Average price per 100 pounds at Chicago and Omaha, by months, July, 1927, to December, 1929

| Year and month | Chicago | | | | | | Omaha | | | | | |
|------------------------|---|--|---|---|---|---------------------------------------|---|--|---|---|---|---------------------------------------|
| | Butcher, bacon, and shipper hogs | | | | | | Butcher, bacon, and shipper hogs | | | | | |
| | Heavy weight, 250 to 350 pounds, medium to choice | Medium weight, 200 to 250 pounds, medium to choice | Light weight, 160 to 200 pounds, medium to choice | Light lights, 130 to 160 pounds, medium to choice | Packing sows, rough and smooth, all weights | Average cost, packer and shipper hogs | Heavy weight, 250 to 350 pounds, medium to choice | Medium weight, 200 to 250 pounds, medium to choice | Light weight, 160 to 200 pounds, medium to choice | Packing sows, rough and smooth, all weights | Feeder and stocker pigs, 70 to 130 pounds, medium to choice | Average cost, packer and shipper hogs |
| | | | | | | | | | | | | |
| 1927 | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| July..... | 9.16 | 9.80 | 9.94 | 9.68 | 7.83 | 9.05 | 8.89 | 9.61 | 9.72 | 7.70 | 7.92 | 8.60 |
| August..... | 9.32 | 10.14 | 10.25 | 9.90 | 7.83 | 9.03 | 8.99 | 9.75 | 10.06 | 7.81 | 8.45 | 8.45 |
| September..... | 10.88 | 11.39 | 11.21 | 10.42 | 9.56 | 10.22 | 10.59 | 10.90 | 10.79 | 9.68 | 9.21 | 10.03 |
| October..... | 11.12 | 11.22 | 10.86 | 9.98 | 9.51 | 10.39 | 10.46 | 10.73 | 10.32 | 9.42 | 9.78 | 9.97 |
| November..... | 9.45 | 9.33 | 8.90 | 8.32 | 8.00 | 8.92 | 8.86 | 9.04 | 8.65 | 7.75 | 8.93 | 8.62 |
| December..... | 8.53 | 8.47 | 8.17 | 7.87 | 7.56 | 8.32 | 8.21 | 8.21 | 7.93 | 7.29 | 7.57 | 8.12 |
| Average, 6 months..... | 9.74 | 10.06 | 9.89 | 9.30 | 8.38 | 9.32 | 9.33 | 9.71 | 9.58 | 8.28 | 8.64 | 8.96 |
| 1928 | | | | | | | | | | | | |
| January..... | 8.26 | 8.34 | 8.17 | 7.89 | 7.25 | 8.25 | 8.02 | 8.06 | 7.91 | 7.10 | 7.17 | 7.98 |
| February..... | 7.99 | 8.21 | 8.12 | 7.76 | 7.15 | 8.08 | 7.63 | 7.81 | 7.78 | 6.75 | 6.46 | 7.66 |
| March..... | 7.99 | 8.23 | 8.10 | 7.58 | 7.14 | 8.08 | 7.66 | 7.88 | 7.78 | 6.82 | 6.50 | 7.74 |
| April..... | 9.10 | 9.32 | 9.22 | 8.65 | 8.04 | 9.28 | 8.72 | 8.95 | 8.87 | 7.76 | 7.16 | 8.82 |
| May..... | 9.62 | 9.76 | 9.37 | 8.70 | 8.71 | 9.67 | 9.18 | 9.39 | 9.10 | 8.38 | 7.39 | 9.21 |
| June..... | 10.04 | 10.06 | 9.74 | 9.07 | 9.01 | 9.91 | 9.66 | 9.68 | 9.26 | 8.68 | 7.43 | 9.42 |
| July..... | 10.84 | 10.94 | 10.77 | 10.28 | 9.77 | 10.65 | 10.60 | 10.68 | 10.16 | 9.26 | 8.19 | 10.20 |
| August..... | 11.64 | 11.86 | 11.69 | 11.36 | 10.63 | 11.53 | 11.18 | 11.42 | 11.06 | 10.16 | 9.28 | 10.89 |
| September..... | 12.14 | 12.26 | 11.98 | 11.60 | 11.02 | 11.89 | 11.56 | 11.81 | 11.54 | 10.56 | 10.14 | 11.35 |
| October..... | 9.73 | 9.77 | 9.63 | 9.28 | 8.84 | 9.57 | 9.37 | 9.40 | 9.17 | 8.48 | 8.59 | 9.16 |
| November..... | 8.92 | 8.92 | 8.74 | 8.44 | 8.18 | 8.83 | 8.55 | 8.57 | 8.34 | 7.92 | 7.33 | 8.52 |
| December..... | 8.65 | 8.66 | 8.56 | 8.20 | 7.97 | 8.61 | 8.20 | 8.22 | 7.97 | 7.71 | 6.63 | 8.25 |
| Average..... | 9.58 | 9.69 | 9.51 | 9.07 | 8.64 | 9.22 | 9.19 | 9.32 | 9.08 | 8.30 | 7.69 | 8.87 |
| 1929 | | | | | | | | | | | | |
| January..... | 9.11 | 9.20 | 9.20 | 8.92 | 8.37 | 9.22 | 8.79 | 8.82 | 8.76 | 8.15 | 7.38 | 8.84 |
| February..... | 10.31 | 10.37 | 10.32 | 9.87 | 9.60 | 10.19 | 9.90 | 9.94 | 9.85 | 9.35 | 7.98 | 9.83 |
| March..... | 11.45 | 11.54 | 11.44 | 10.95 | 10.58 | 11.44 | 11.00 | 11.06 | 10.80 | 10.36 | 9.54 | 11.04 |
| April..... | 11.40 | 11.48 | 11.38 | 10.92 | 10.42 | 11.41 | 10.96 | 11.01 | 10.86 | 10.19 | 9.58 | 10.98 |
| May..... | 10.75 | 10.95 | 10.79 | 10.57 | 9.78 | 10.81 | 10.23 | 10.41 | 10.22 | 9.37 | 9.23 | 10.28 |
| June..... | 10.69 | 10.91 | 10.86 | 10.72 | 9.58 | 10.72 | 10.28 | 10.55 | 10.44 | 9.27 | 9.56 | 10.31 |
| July..... | 11.23 | 11.69 | 11.78 | 11.57 | 10.03 | 11.20 | 10.74 | 11.18 | 11.10 | 9.75 | 9.92 | 10.69 |
| August..... | 10.70 | 11.29 | 11.52 | 11.20 | 9.27 | 10.52 | 10.13 | 10.74 | 10.79 | 8.90 | 9.54 | 9.86 |
| September..... | 9.97 | 10.53 | 10.48 | 9.98 | 8.68 | 9.85 | 9.50 | 9.99 | 9.86 | 8.28 | 8.24 | 9.20 |
| October..... | 9.42 | 9.68 | 9.71 | 9.51 | 8.29 | 9.38 | 8.89 | 9.22 | 9.11 | 7.84 | 8.42 | 8.78 |
| November..... | 9.06 | 9.14 | 9.02 | 8.84 | 8.24 | 9.06 | 8.62 | 8.74 | 8.65 | 7.80 | 7.62 | 8.56 |
| December..... | 9.40 | 9.44 | 9.38 | 9.20 | 8.32 | 9.34 | 8.92 | 9.00 | 8.88 | 8.07 | 7.44 | 8.96 |
| Average..... | 10.29 | 10.52 | 10.49 | 10.19 | 9.26 | 10.16 | 9.83 | 10.06 | 9.94 | 8.94 | 8.70 | 9.84 |

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Earlier data in 1927 Yearbook, pp. 1012-1014.

BEEF CATTLE, HOGS, SHEEP, HORSES, AND MULES

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TABLE 383.—Hogs: Monthly slaughter ¹ under Federal inspection, 1907-1929

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| 1907..... | 3,410 | 2,921 | 2,665 | 2,667 | 3,317 | 3,241 | 2,929 | 2,301 | 1,988 | 2,219 | 2,135 | 3,094 | 32,885 |
| 1908..... | 4,961 | 3,890 | 3,111 | 2,304 | 3,088 | 3,094 | 2,416 | 2,231 | 2,231 | 3,368 | 3,803 | 4,147 | 38,643 |
| 1909..... | 3,876 | 2,653 | 3,013 | 2,343 | 2,629 | 2,719 | 2,907 | 1,822 | 1,955 | 2,397 | 2,800 | 3,000 | 31,395 |
| 1910..... | 2,693 | 2,324 | 1,891 | 1,778 | 2,206 | 2,612 | 1,988 | 1,824 | 1,564 | 1,851 | 2,456 | 2,827 | 26,014 |
| 1911..... | 2,742 | 2,633 | 2,973 | 2,589 | 3,008 | 3,462 | 2,560 | 2,032 | 2,172 | 2,720 | 3,639 | 3,603 | 34,133 |
| 1912..... | 4,147 | 3,302 | 2,700 | 2,412 | 2,844 | 2,835 | 2,354 | 1,875 | 1,701 | 2,455 | 3,020 | 3,407 | 33,053 |
| 1913..... | 3,708 | 2,844 | 2,334 | 2,487 | 3,046 | 3,057 | 2,557 | 2,268 | 2,133 | 2,681 | 3,165 | 3,919 | 34,199 |
| 1914..... | 3,489 | 2,723 | 2,548 | 2,312 | 2,569 | 2,920 | 2,260 | 1,799 | 1,907 | 2,082 | 3,047 | 4,271 | 32,532 |
| 1915..... | 4,274 | 3,885 | 3,446 | 2,563 | 2,869 | 3,246 | 2,493 | 2,041 | 1,890 | 2,494 | 3,739 | 5,442 | 38,381 |
| 1916..... | 5,387 | 4,276 | 3,430 | 2,853 | 3,275 | 3,163 | 2,530 | 2,617 | 2,287 | 3,327 | 4,771 | 5,267 | 43,084 |
| 1917..... | 4,629 | 3,484 | 2,985 | 2,645 | 3,084 | 2,685 | 2,411 | 1,705 | 1,322 | 2,195 | 3,043 | 3,723 | 33,910 |
| 1918..... | 3,961 | 3,998 | 3,926 | 3,290 | 3,092 | 2,783 | 2,940 | 2,283 | 1,980 | 3,018 | 4,280 | 5,662 | 41,214 |
| 1919..... | 5,846 | 4,266 | 3,443 | 3,208 | 3,743 | 3,728 | 2,884 | 1,949 | 1,997 | 2,686 | 3,270 | 4,790 | 41,812 |
| 1920..... | 5,079 | 3,104 | 3,482 | 2,590 | 3,585 | 3,506 | 2,644 | 2,191 | 1,988 | 2,487 | 3,329 | 3,985 | 38,019 |
| 1921..... | 4,347 | 3,799 | 3,047 | 3,003 | 3,274 | 3,618 | 2,821 | 2,530 | 2,422 | 2,866 | 3,447 | 3,807 | 38,982 |
| 1922..... | 3,985 | 3,480 | 3,350 | 2,946 | 3,716 | 4,046 | 3,104 | 2,888 | 2,747 | 3,332 | 4,318 | 5,201 | 43,114 |
| 1923..... | 5,134 | 4,231 | 4,838 | 4,179 | 4,325 | 4,303 | 3,983 | 3,556 | 3,212 | 4,328 | 5,341 | 5,904 | 53,334 |
| 1924..... | 5,911 | 5,006 | 4,536 | 4,073 | 4,278 | 4,288 | 4,114 | 3,070 | 2,857 | 3,498 | 4,641 | 6,600 | 52,873 |
| 1925..... | 5,979 | 4,447 | 3,299 | 3,037 | 3,186 | 3,732 | 2,819 | 2,452 | 2,598 | 3,314 | 3,646 | 4,533 | 43,043 |
| 1926..... | 4,501 | 3,351 | 3,562 | 3,105 | 3,131 | 3,430 | 3,127 | 2,834 | 2,616 | 2,976 | 3,610 | 4,394 | 40,636 |
| 1927..... | 4,514 | 3,395 | 3,837 | 3,330 | 3,766 | 4,253 | 3,431 | 3,050 | 2,534 | 2,969 | 3,688 | 4,869 | 43,633 |
| 1928..... | 5,479 | 5,780 | 5,140 | 3,446 | 3,885 | 4,078 | 2,084 | 2,545 | 2,508 | 3,713 | 4,455 | 5,782 | 49,795 |
| 1929..... | 5,738 | 4,478 | 3,645 | 3,761 | 3,798 | 3,756 | 3,597 | 3,130 | 3,104 | 3,857 | 4,499 | 5,083 | 48,445 |

Bureau of Animal Industry.

¹ The figures include rejected carcasses.

TABLE 384.—Hogs, slaughter statistics: Source of supply, classification, slaughter costs, weights, and yields, 1923-1929

| Year and month | Source of supply | | Sex classification | | | Average live cost per 100 pounds | Average live weight | Dressed weight as percentage of live weight | By-product yield (on basis of live weight) | | | | |
|----------------|------------------|--------|--------------------|----------|------------------|----------------------------------|---------------------|---|--|--------------|------------|-------------------------------|--|
| | Stock-yards | Other | Sows | Bar-rows | Stags and hounds | | | | Lard ¹ | Edible offal | Trim-mings | Inedi-ble grease ¹ | |
| | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | Dollars | Pounds | P. ct. | P. ct. | P. ct. | P. ct. | P. ct. | |
| 1923..... | 76.07 | 23.93 | 52.42 | 46.86 | 0.72 | 7.59 | 225.33 | 76.72 | 16.49 | 2.14 | 4.53 | 1.37 | |
| 1924..... | 77.95 | 22.05 | 52.34 | 46.96 | .70 | 8.04 | 222.31 | 75.33 | 16.45 | 2.18 | 4.59 | 1.35 | |
| 1925..... | 75.99 | 24.01 | 52.73 | 46.65 | .62 | 11.79 | 225.50 | 75.67 | 15.04 | 2.49 | 5.08 | 1.29 | |
| 1926..... | 72.85 | 27.15 | 51.58 | 47.78 | .64 | 12.47 | 235.06 | 76.42 | 15.89 | 2.69 | 5.50 | 1.31 | |
| 1927..... | 67.63 | 32.37 | 50.31 | 49.10 | .59 | 10.06 | 233.33 | 76.27 | 15.36 | 2.73 | 5.64 | 1.22 | |
| 1928..... | 64.56 | 35.44 | 51.38 | 48.04 | .58 | 9.20 | 239.26 | 75.41 | 15.40 | 2.98 | 5.53 | 1.19 | |
| 1929..... | 59.79 | 40.21 | 51.76 | 47.68 | .56 | 10.08 | 231.72 | 75.32 | 15.75 | 3.17 | 6.24 | 1.18 | |
| 1929 | | | | | | | | | | | | | |
| January..... | 58.74 | 41.26 | 47.15 | 52.48 | .37 | 9.00 | 225.41 | 75.50 | 16.57 | 3.21 | 5.42 | 1.16 | |
| February..... | 57.04 | 42.96 | 46.53 | 53.08 | .39 | 9.96 | 227.89 | 75.67 | 16.21 | 3.05 | 6.16 | 1.15 | |
| March..... | 60.20 | 39.80 | 48.04 | 51.41 | .55 | 11.22 | 229.47 | 76.23 | 16.06 | 3.12 | 5.93 | 1.20 | |
| April..... | 62.31 | 37.69 | 49.75 | 49.37 | .88 | 11.17 | 229.82 | 76.06 | 16.01 | 2.99 | 6.83 | 1.20 | |
| May..... | 61.38 | 38.62 | 50.70 | 48.51 | .79 | 10.77 | 232.34 | 75.70 | 16.14 | 3.20 | 6.25 | 1.20 | |
| June..... | 60.38 | 39.62 | 52.72 | 46.60 | .68 | 10.58 | 239.59 | 75.01 | 16.08 | 3.09 | 6.62 | 1.19 | |
| July..... | 62.04 | 37.96 | 60.67 | 38.79 | .64 | 11.09 | 250.01 | 75.42 | 15.59 | 3.19 | 6.47 | 1.21 | |
| August..... | 61.47 | 38.53 | 60.12 | 39.30 | .58 | 10.65 | 249.35 | 75.40 | 15.68 | 3.18 | 6.38 | 1.20 | |
| September..... | 63.66 | 36.34 | 57.48 | 42.02 | .50 | 10.01 | 238.34 | 74.93 | 15.49 | 3.26 | 6.77 | 1.20 | |
| October..... | 62.21 | 37.79 | 53.65 | 45.81 | .54 | 9.43 | 228.76 | 74.05 | 14.65 | 3.23 | 6.58 | 1.18 | |
| November..... | 57.40 | 42.60 | 51.64 | 47.90 | .56 | 9.01 | 220.12 | 74.78 | 14.68 | 3.30 | 6.32 | 1.14 | |
| December..... | 54.80 | 45.20 | 49.75 | 49.77 | .48 | 9.22 | 223.64 | 75.09 | 15.58 | 3.16 | 5.84 | 1.16 | |

Bureau of Agricultural Economics. Compiled from monthly reports to the bureau from packers and slaughterers, whose slaughterings equaled 75 to 85 per cent of total slaughter under Federal inspection.

¹ Rendered.

NOTE.—A table similar to Table 388, 1928 Yearbook, hogs—livestock and meat situation, is omitted.

TABLE 385.—*Hogs: Slaughter in specified countries, average pre-war and annual, 1914-1928*

| Year | United States, Federal inspected | Germany, inspected slaughter | Denmark, in export slaughterhouses | England and Wales, sold off farms for slaughter ¹ | Scotland, sold off farms for slaughter ¹ | Ireland, purchased by Irish bacon curers | Canada | Netherlands receipts at 21 markets |
|-----------------|----------------------------------|------------------------------|------------------------------------|--|---|--|-----------|------------------------------------|
| | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands |
| Average pre-war | 31,759 | 16,406 | 2,503 | 3,487 | | 1,282 | 4,280 | 875 |
| 1914 | 32,532 | (²) | 2,858 | | | | | 1,085 |
| 1915 | 38,381 | (²) | 2,504 | | | | | 842 |
| 1916 | 43,084 | (²) | 2,542 | | | | | 850 |
| 1917 | 33,910 | (²) | 2,479 | | | | | 600 |
| 1918 | 41,214 | (²) | 324 | | | | | 217 |
| 1919 | 41,812 | 1,368 | 456 | | | 874 | 5,526 | 422 |
| 1920 | 38,019 | 3,024 | 930 | 2,700 | 146 | 808 | 4,834 | 648 |
| 1921 | 38,982 | 6,825 | 1,641 | 3,471 | 178 | 1,030 | 5,297 | 1,362 |
| 1922 | 43,114 | 6,923 | 2,215 | 3,229 | 176 | 926 | 5,382 | 865 |
| 1923 | 53,334 | 5,830 | 3,414 | 3,691 | 245 | 955 | 6,056 | 906 |
| 1924 | 52,873 | 10,527 | 4,024 | 4,500 | 242 | 1,110 | 6,625 | 1,008 |
| 1925 | 43,043 | 12,060 | 3,766 | 3,588 | | 911 | 5,720 | 1,045 |
| 1926 | 40,636 | 13,072 | 3,838 | 3,674 | | 910 | 5,636 | 1,025 |
| 1927 | 43,633 | 17,279 | 5,098 | 3,680 | | 1,050 | 5,965 | 1,151 |
| 1928 | 49,795 | 19,391 | 5,373 | 4,112 | | | 5,880 | |

Bureau of Agricultural Economics. Compiled from official sources and cabled reports from agricultural commissioners abroad.

¹ For years ended May 31 following.

² Average for 5 years immediately preceding war period if available, otherwise for any year or years within that period unless otherwise stated. In countries having changed boundaries, the figures are estimates for 1 year only for numbers within present boundaries.

³ Not available for present boundaries. For former boundaries, the numbers slaughtered are as follows in thousands—1914, 10,441; 1915, 13,293; 1916, 6,548; 1917, 5,795; 1918, 2,430.

TABLE 386.—*Lard: Total stocks in cold-storage warehouses and meat-packing establishments, United States, 1916-1929*¹

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1916 | 63,304 | 92,342 | 111,897 | 97,237 | 106,731 | 85,113 | 87,127 | 95,991 | 82,028 | 71,570 | 56,929 | 58,980 |
| 1917 | 80,977 | 86,208 | 98,400 | 65,179 | 61,640 | 72,365 | 85,197 | 112,249 | 102,172 | 69,929 | 37,095 | 44,267 |
| 1918 | 54,539 | 58,310 | 65,355 | 89,854 | 103,373 | 106,194 | 107,871 | 102,411 | 104,668 | 90,308 | 76,124 | 81,676 |
| 1919 | 104,274 | 138,353 | 125,410 | 112,469 | 112,409 | 83,090 | 92,132 | 100,478 | 87,947 | 76,456 | 66,036 | 49,147 |
| 1920 | 62,614 | 97,648 | 111,975 | 132,993 | 141,819 | 152,307 | 193,216 | 191,531 | 170,774 | 109,258 | 47,329 | 36,683 |
| 1921 | 59,319 | 83,549 | 117,690 | 128,614 | 152,428 | 181,992 | 204,301 | 194,490 | 149,896 | 85,115 | 48,850 | 42,001 |
| 1922 | 47,441 | 61,202 | 61,297 | 86,031 | 96,055 | 123,798 | 154,254 | 143,084 | 119,755 | 75,338 | 36,750 | 22,506 |
| 1923 | 48,908 | 56,266 | 59,101 | 86,743 | 85,251 | 84,530 | 123,896 | 143,579 | 115,800 | 72,608 | 35,225 | 35,237 |
| 1924 | 49,340 | 54,130 | 69,610 | 85,722 | 102,317 | 127,949 | 152,520 | 149,672 | 124,676 | 84,198 | 31,706 | 35,713 |
| 1925 | 61,049 | 112,704 | 161,927 | 160,182 | 151,499 | 138,296 | 145,919 | 145,624 | 114,724 | 71,620 | 37,256 | 38,710 |
| 1926 | 42,478 | 64,187 | 76,145 | 93,108 | 96,365 | 106,824 | 120,527 | 153,572 | 151,223 | 106,553 | 72,355 | 49,744 |
| 1927 | 49,992 | 69,576 | 77,103 | 92,069 | 99,611 | 111,976 | 147,318 | 179,136 | 167,018 | 118,174 | 72,121 | 46,124 |
| 1928 | 54,555 | 84,007 | 121,032 | 164,506 | 178,068 | 186,673 | 214,479 | 204,989 | 177,888 | 126,890 | 63,474 | 67,257 |
| 1929 | 85,217 | 140,526 | 178,864 | 179,428 | 184,748 | 183,490 | 199,609 | 203,610 | 180,085 | 153,600 | 99,854 | 68,517 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

¹ Lard includes all prime steam, kettle-rendered, neutral, and other pure lards. It does not include tallow substitutes nor compounds.

TABLE 387.—*Pork: Stocks in cold-storage warehouses and meat-packing establishments, United States, 1916-1929*

DRY SALT CURED, AND IN PROCESS OF CURE

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1916 | 145,661 | 194,053 | 226,910 | 206,703 | 202,392 | 205,008 | 202,088 | 205,251 | 183,194 | 140,908 | 118,958 | 142,858 |
| 1917 | 200,999 | 228,424 | 250,059 | 234,390 | 219,819 | 213,802 | 224,813 | 231,905 | 195,678 | 143,319 | 110,632 | 150,882 |
| 1918 | 252,934 | 311,422 | 402,734 | 118,114 | 171,809 | 193,795 | 402,549 | 370,203 | 333,172 | 283,572 | 217,194 | 243,002 |
| 1919 | 357,254 | 471,747 | 435,661 | 430,205 | 425,411 | 402,452 | 381,736 | 366,547 | 338,270 | 332,786 | 281,930 | 242,224 |
| 1920 | 262,620 | 332,848 | 402,229 | 457,745 | 462,389 | 430,782 | 404,681 | 381,328 | 316,433 | 233,349 | 150,842 | 114,400 |
| 1921 | 144,907 | 202,909 | 251,803 | 253,390 | 240,443 | 240,610 | 250,752 | 231,511 | 200,201 | 119,974 | 108,611 | 56,731 |
| 1922 | 111,071 | 128,690 | 139,281 | 145,183 | 142,030 | 157,689 | 186,948 | 179,856 | 165,668 | 122,783 | 85,671 | 88,017 |
| 1923 | 121,125 | 155,922 | 178,024 | 206,429 | 227,728 | 214,453 | 217,862 | 221,716 | 191,711 | 146,974 | 108,850 | 110,824 |
| 1924 | 148,121 | 167,507 | 178,258 | 192,934 | 191,882 | 206,009 | 212,158 | 202,618 | 180,127 | 135,702 | 81,460 | 78,871 |
| 1925 | 118,718 | 136,125 | 150,819 | 142,950 | 145,548 | 142,232 | 162,618 | 164,374 | 152,555 | 128,599 | 106,011 | 56,746 |
| 1926 | 110,617 | 138,005 | 144,071 | 151,286 | 140,321 | 136,801 | 118,161 | 108,882 | 172,766 | 143,572 | 98,521 | 66,765 |
| 1927 | 68,203 | 86,135 | 101,156 | 121,676 | 129,637 | 143,143 | 173,256 | 185,920 | 178,107 | 140,420 | 100,922 | 77,240 |
| 1928 | 97,335 | 119,751 | 160,009 | 178,012 | 173,652 | 169,663 | 174,906 | 164,473 | 156,462 | 125,899 | 101,123 | 102,440 |
| 1929 | 143,011 | 167,561 | 179,776 | 178,595 | 185,580 | 171,450 | 163,805 | 172,308 | 160,519 | 139,256 | 111,092 | 88,782 |

PICKLED,¹ CURED, AND IN PROCESS OF CURE

| | | | | | | | | | | | | |
|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1916 | 230,881 | 298,939 | 350,750 | 351,051 | 337,464 | 326,183 | 359,300 | 350,570 | 303,399 | 251,004 | 209,061 | 251,519 |
| 1917 | 307,478 | 348,269 | 378,847 | 362,931 | 381,236 | 403,185 | 412,810 | 403,704 | 328,943 | 252,152 | 192,884 | 204,907 |
| 1918 | 299,008 | 322,004 | 369,014 | 402,377 | 406,191 | 397,186 | 372,347 | 365,941 | 315,517 | 219,827 | 223,148 | 242,976 |
| 1919 | 303,763 | 392,260 | 435,197 | 431,714 | 431,671 | 440,989 | 422,387 | 384,764 | 341,724 | 297,712 | 239,719 | 226,083 |
| 1920 | 279,467 | 337,238 | 369,026 | 361,973 | 353,864 | 371,593 | 403,719 | 380,896 | 361,381 | 295,169 | 254,834 | 252,345 |
| 1921 | 204,993 | 316,328 | 376,367 | 553,355 | 541,366 | 291,366 | 346,623 | 320,190 | 257,244 | 212,528 | 221,345 | 270 |
| 1922 | 252,822 | 284,487 | 321,950 | 347,276 | 348,305 | 363,396 | 391,474 | 385,692 | 369,187 | 313,517 | 278,812 | 302,708 |
| 1923 | 377,107 | 412,806 | 451,279 | 469,130 | 499,119 | 483,673 | 473,569 | 449,441 | 413,708 | 367,374 | 325,156 | 384,694 |
| 1924 | 434,030 | 468,892 | 500,784 | 512,190 | 500,683 | 483,372 | 473,914 | 443,918 | 408,928 | 351,485 | 283,710 | 280,808 |
| 1925 | 398,521 | 443,025 | 483,302 | 468,099 | 467,395 | 425,481 | 407,610 | 373,227 | 338,156 | 284,485 | 256,684 | 281,128 |
| 1926 | 294,642 | 319,726 | 345,661 | 346,049 | 338,905 | 320,305 | 333,305 | 340,687 | 330,326 | 293,106 | 257,726 | 246,222 |
| 1927 | 306,904 | 352,681 | 392,042 | 420,037 | 435,967 | 432,965 | 450,172 | 440,744 | 407,239 | 341,460 | 289,553 | 276,016 |
| 1928 | 320,436 | 370,916 | 461,264 | 496,322 | 480,089 | 459,878 | 454,826 | 408,994 | 351,936 | 295,309 | 265,988 | 292,636 |
| 1929 | 375,217 | 424,921 | 473,916 | 453,612 | 452,868 | 443,044 | 430,317 | 412,619 | 382,750 | 342,038 | 304,400 | 316,180 |

FROZEN

| | | | | | | | | | | | | |
|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|--------|
| 1916 | 44,194 | 63,376 | 88,604 | 88,344 | 77,812 | 83,195 | 82,571 | 85,845 | 63,420 | 38,851 | 23,988 | 32,015 |
| 1917 | 50,564 | 60,062 | 63,352 | 64,996 | 74,728 | 77,534 | 91,562 | 96,648 | 72,286 | 39,767 | 25,347 | 21,504 |
| 1918 | 61,063 | 61,659 | 104,630 | 116,548 | 117,786 | 118,601 | 117,976 | 108,220 | 71,385 | 46,593 | 36,968 | 34,790 |
| 1919 | 61,539 | 104,708 | 128,897 | 142,189 | 139,205 | 144,212 | 155,263 | 131,137 | 90,510 | 61,417 | 47,271 | 44,864 |
| 1920 | 55,551 | 106,677 | 132,095 | 148,922 | 144,453 | 156,963 | 170,054 | 161,804 | 129,197 | 87,592 | 67,148 | 60,007 |
| 1921 | 93,990 | 150,594 | 208,889 | 219,964 | 200,706 | 194,486 | 182,103 | 149,435 | 103,486 | 64,682 | 38,517 | 37,513 |
| 1922 | 51,203 | 71,722 | 86,219 | 98,765 | 103,907 | 114,571 | 128,962 | 117,903 | 84,815 | 46,796 | 30,688 | 33,774 |
| 1923 | 72,728 | 120,196 | 154,377 | 189,115 | 213,224 | 210,645 | 217,074 | 195,002 | 148,753 | 98,798 | 71,640 | 82,088 |
| 1924 | 126,718 | 164,491 | 199,044 | 227,284 | 215,767 | 201,728 | 186,596 | 164,049 | 121,816 | 77,986 | 42,561 | 48,781 |
| 1925 | 130,125 | 199,642 | 231,234 | 218,508 | 201,246 | 180,645 | 168,527 | 131,935 | 93,078 | 54,294 | 29,910 | 27,153 |
| 1926 | 57,960 | 98,311 | 120,115 | 129,259 | 124,569 | 117,366 | 120,707 | 133,104 | 119,994 | 77,673 | 49,370 | 55,241 |
| 1927 | 97,660 | 180,255 | 177,870 | 193,733 | 204,008 | 211,742 | 220,847 | 214,607 | 181,072 | 126,887 | 76,644 | 65,666 |
| 1928 | 105,664 | 164,971 | 264,043 | 323,403 | 306,951 | 289,825 | 285,628 | 245,714 | 173,617 | 103,879 | 66,049 | 66,686 |
| 1929 | 151,811 | 245,798 | 291,050 | 269,754 | 285,110 | 256,291 | 247,816 | 229,397 | 170,131 | 119,204 | 75,910 | 84,667 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

¹ Pickled pork includes sweet-pickled, plain-brine, and barreled pork.

NOTE.—A table similar to Table 392, 1928 Yearbook, wholesale and retail prices of certain pork products, is omitted.

TABLE 388.—Pork and pork products: International trade, average 1911-1913, annual 1925-1928

| Country | Year ended Dec. 31 | | | | | | | | | |
|-------------------------------|---------------------|----------------------------|------------------------|-----------------------------|------------------------|-----------------------------|------------------------|-----------------------------|-------------------------|-----------------------------|
| | Average 1911-1913 | | 1925 | | 1926 | | 1927 | | 1928 preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | | | | | | | | | | |
| United States | 1,000 pounds 171 | 1,000 pounds 1,019, 861 | 1,000 pounds 7, 235 | 1,000 pounds 1, 241, 209 | 1,000 pounds 9, 136 | 1,000 pounds 1, 131, 335 | 1,000 pounds 4, 324 | 1,000 pounds 1, 002, 380 | 1,000 pounds 12, 846 | 1,000 pounds 1, 101, 988 |
| Denmark | 7, 124 | 288, 086 | 2, 826 | 462, 923 | 2, 540 | 460, 191 | 3, 589 | 306, 322 | 12, 795 | 1, 650, 462 |
| Netherlands | 88, 143 | 138, 916 | 13, 860 | 289, 494 | 23, 511 | 264, 391 | 13, 863 | 306, 312 | 15, 232 | 273, 177 |
| Canada | 20, 189 | 47, 694 | 18, 821 | 156, 717 | 18, 712 | 113, 821 | 11, 492 | 97, 047 | 15, 237 | 53, 357 |
| Irish Free State | 0 | 0 | 63, 316 | 78, 280 | 94, 676 | 78, 223 | 52, 976 | 67, 047 | 48, 500 | 113, 957 |
| Sweden | 6, 736 | 10, 445 | 15, 395 | 17, 041 | 11, 385 | 31, 610 | 7, 530 | 61, 255 | 8, 863 | 51, 496 |
| Poland | 0 | 0 | 26, 339 | 57, 735 | 17, 385 | 39, 864 | 40, 318 | 38, 388 | 57, 292 | 46, 987 |
| China | 0 | 7, 679 | 16, 177 | 37, 171 | 14, 385 | 14, 492 | 10, 801 | 10, 801 | 57, 442 | 10, 089 |
| Hungary | 0 | 234 | 32, 485 | 32, 485 | 17 | 3, 685 | 19 | 29, 576 | 56 | 18, 893 |
| New Zealand | 248 | 1, 049 | 139 | 5, 784 | 17 | 3, 639 | 19 | 12, 764 | 6 | 18, 893 |
| Australia ¹ | 823 | 1, 024 | 1, 397 | 3, 249 | 1, 220 | 3, 720 | 1, 853 | 3, 631 | 6 | 18, 893 |
| Argentina | 1, 977 | 9 | 50 | 1, 416 | 55 | 12, 354 | 232 | 8, 266 | 10, 191 | 10, 191 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom | 874, 929 | 15, 820 | 1, 373, 856 | 6, 162 | 1, 297, 155 | 5, 381 | 1, 358, 370 | 6, 186 | 1, 416, 466 | 6, 256 |
| Germany | 283, 069 | 5, 532 | 412, 163 | 2, 819 | 285, 273 | 4, 071 | 296, 743 | 5, 039 | 240, 873 | 4, 832 |
| Cuba | 86, 973 | 0 | 137, 214 | 0 | 131, 164 | 0 | 126, 019 | 0 | 0 | 0 |
| France | 56, 824 | 24, 668 | 37, 277 | 3, 324 | 38, 795 | 3, 638 | 162, 736 | 3, 734 | 102, 021 | 3, 225 |
| Czechoslovakia | 0 | 0 | 84, 353 | 4, 571 | 89, 671 | 1, 200 | 73, 439 | 3, 772 | 71, 630 | 3, 285 |
| Austria | 14, 338 | 3, 343 | 47, 804 | 3, 043 | 28, 152 | 1, 735 | 27, 398 | 9, 907 | 31, 063 | 6, 404 |
| Belgium | 22, 232 | 16, 254 | 12, 902 | 1, 562 | 11, 715 | 12, 024 | 17, 398 | 10, 100 | 19, 733 | 6, 815 |
| Italy | 74, 911 | 0 | 13, 360 | 1, 562 | 8, 444 | 6, 662 | 6, 496 | 3, 606 | 30, 147 | 1, 108 |
| Norway | 9, 731 | 26 | 13, 319 | 805 | 8, 256 | 6 | 4, 516 | 115 | 8, 266 | 181 |
| Finland | 0 | 0 | 12, 843 | 0 | 14, 234 | 373 | 11, 956 | 115 | 13, 848 | 181 |
| Peru | 0 | 0 | 6, 893 | 0 | 14, 742 | 0 | 11, 090 | 23 | 6, 496 | 37 |
| Switzerland | 21, 976 | 105 | 5, 520 | 819 | 6, 594 | 34 | 6, 657 | 23 | 7, 359 | 0 |
| Philippine Islands | 4, 553 | 0 | 5, 873 | 0 | 6, 174 | 0 | 7, 531 | 0 | 0 | 0 |
| Spain | 8, 249 | 641 | 1, 567 | 1, 700 | 4, 474 | 2, 972 | 2, 931 | 0 | 0 | 0 |
| Union of South Africa | 3, 767 | 30 | 1, 567 | 1, 076 | 1, 076 | 1, 514 | 1, 972 | 222 | 1, 416 | 115 |
| Brazil | 3, 196 | 278 | 9, 746 | 312 | 1, 281 | 594 | 1, 500 | 260 | 0 | 46 |
| Chile | 0 | 9 | 511 | 259 | 830 | 5 | 0 | 0 | 0 | 0 |
| Total, 29 countries | 1, 585, 242 | 1, 604, 439 | 2, 338, 410 | 2, 358, 911 | 2, 203, 740 | 2, 199, 028 | 2, 267, 140 | 2, 297, 466 | 2, 109, 017 | 2, 370, 816 |

Bureau of Agricultural Economics. Official sources.

¹ Year ended June 30.² Year ended December 31.³ Average for Austria-Hungary.

TABLE 389.—*Lard, refined: Average price per 100 pounds, Chicago, by months, 1920-1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1920 | 23.14 | 22.93 | 22.71 | 22.75 | 22.98 | 21.71 | 22.58 | 23.28 | 22.07 | 18.15 | 22.25 | 22.25 | 22.25 |
| 1921 | 16.03 | 14.91 | 14.48 | 13.07 | 11.88 | 12.03 | 13.94 | 13.65 | 13.51 | 12.16 | 11.62 | 11.25 | 13.21 |
| 1922 | 11.19 | 12.59 | 13.50 | 12.62 | 13.15 | 13.22 | 13.06 | 13.30 | 13.00 | 14.12 | 13.78 | 13.31 | 13.07 |
| 1923 | 13.20 | 13.25 | 13.87 | 13.42 | 13.12 | 13.18 | 12.84 | 12.83 | 15.06 | 15.22 | 15.72 | 15.04 | 13.90 |
| 1924 | 14.52 | 13.03 | 12.84 | 12.50 | 12.19 | 12.13 | 13.65 | 15.04 | 16.25 | 18.05 | 16.68 | 18.00 | 14.65 |
| 1925 | 17.59 | 17.03 | 18.25 | 17.07 | 16.50 | 18.13 | 18.42 | 18.94 | 18.95 | 18.75 | 18.50 | 16.67 | 17.90 |
| 1926 | 16.81 | 16.44 | 16.70 | 16.75 | 17.13 | 18.48 | 18.00 | 17.38 | 17.50 | 16.75 | 15.75 | 15.25 | 16.91 |
| 1927 | 13.59 | 13.72 | 14.38 | 14.32 | 14.12 | 13.35 | 12.25 | 12.54 | 14.25 | 14.50 | 13.60 | 13.25 | 13.66 |
| 1928 | 12.50 | 11.00 | 11.50 | 12.50 | 13.10 | 13.50 | 14.00 | 14.70 | 15.25 | 14.40 | 13.62 | 12.88 | 13.36 |
| 1929 | 12.75 | 12.75 | 13.31 | 13.25 | 12.85 | 12.85 | 13.22 | 13.56 | 13.81 | 13.17 | 12.21 | 11.94 | 12.97 |

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Prices, 1905 to January, 1920, compiled from the National Provisioner, available in 1927 Yearbook, p. 1018.

TABLE 390.—*Lard, American prime western steam: Average price per pound in Liverpool, 1920-1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1920 | 32.0 | 29.5 | 32.9 | 27.2 | 27.4 | 26.7 | 26.7 | 13.4 | 13.2 | 12.2 | 23.8 | 24.2 | 24.2 |
| 1921 | 23.4 | 23.3 | 15.7 | 13.2 | 11.7 | 12.1 | 13.6 | 13.4 | 13.2 | 12.2 | 12.6 | 11.7 | 14.7 |
| 1922 | 11.3 | 12.9 | 13.1 | 12.8 | 13.6 | 13.5 | 13.2 | 13.3 | 12.7 | 13.2 | 14.1 | 13.6 | 13.1 |
| 1923 | 13.3 | 13.0 | 13.7 | 13.6 | 12.9 | 13.0 | 12.7 | 12.7 | 14.0 | 14.5 | 15.7 | 15.1 | 13.7 |
| 1924 | 14.8 | 13.1 | 12.8 | 12.7 | 12.3 | 12.2 | 13.7 | 15.8 | 15.8 | 18.1 | 17.2 | 18.1 | 14.7 |
| 1925 | 18.0 | 17.5 | 18.7 | 17.8 | 17.6 | 19.1 | 19.3 | 19.2 | 19.2 | 17.9 | 17.8 | 16.6 | 18.2 |
| 1926 | 17.2 | 16.5 | 16.5 | 16.0 | 17.6 | 18.4 | 17.8 | 17.0 | 16.6 | 15.8 | 14.2 | 14.3 | 16.5 |
| 1927 | 14.3 | 14.4 | 14.4 | 14.3 | 14.1 | 14.4 | 14.3 | 13.8 | 14.6 | 14.4 | 14.0 | 13.5 | 14.2 |
| 1928 | 13.6 | 12.9 | 13.0 | 13.3 | 13.4 | 13.3 | 13.7 | 13.9 | 14.4 | 13.9 | 13.4 | 13.2 | 13.5 |
| 1929 | 13.4 | 13.5 | 13.9 | 13.3 | 13.4 | 13.5 | 13.9 | 13.8 | 13.5 | 12.7 | 12.1 | 11.8 | 13.2 |

Bureau of Agricultural Economics. Compiled from Manchester Guardian. An average of Friday quotations. Converted at monthly average rate of exchange as given in Federal Reserve Bulletins to 1925, inclusive; subsequently at par of exchange.

¹ Government control of prices ended on Feb. 28, 1921.

TABLE 391.—*Bacon, Wiltshire sides,¹ green, firsts: Average price per pound at Bristol, England, 1909-1929*

| Year and month | American | Canadian | Danish | Irish | British | Year and month | American | Canadian | Danish | Irish | British |
|----------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1909 | 13.0 | 14.3 | 15.0 | 15.9 | 16.7 | 1928 | | | | | |
| 1910 | 15.2 | 15.6 | 15.9 | 16.6 | 17.8 | January | 16.5 | | 18.3 | 21.9 | 26.5 |
| 1911 | 12.8 | 13.1 | 14.3 | 14.8 | 15.8 | February | 16.4 | | 18.5 | 22.6 | 26.5 |
| 1912 | 13.8 | 14.5 | 15.9 | 15.8 | 16.3 | March | 16.1 | | 18.6 | 23.1 | 26.8 |
| 1913 | 15.8 | 16.3 | 17.1 | 17.4 | 18.4 | April | 16.2 | | 18.9 | 24.1 | 27.6 |
| 1914 | 15.5 | 15.7 | 16.4 | 17.6 | 18.2 | May | 15.6 | | 20.2 | 24.8 | 26.9 |
| 1915 | 17.0 | 18.4 | 20.4 | 20.8 | 21.4 | June | 16.4 | | 23.2 | 25.3 | 26.5 |
| 1916 | 19.8 | 22.0 | 24.0 | 24.7 | 26.0 | July | 20.6 | | 24.3 | 25.2 | 26.4 |
| 1917 | 30.1 | | | 33.0 | 33.6 | August | 20.9 | | 24.3 | 25.2 | 26.5 |
| 1918 | 38.5 | | | | 30.3 | September | 20.3 | | 23.9 | 24.8 | 25.4 |
| 1919 | 37.1 | 37.9 | | 38.4 | 38.4 | October | 19.5 | | 20.8 | 22.0 | 23.0 |
| 1920 | 31.6 | 33.1 | 34.2 | 41.7 | 42.8 | November | 18.4 | | 20.3 | 21.9 | 23.1 |
| 1921 | 21.8 | 26.5 | 32.8 | 34.7 | 36.2 | December | 18.5 | | 22.6 | 23.0 | 24.8 |
| 1922 | 21.2 | 25.2 | 29.7 | 32.5 | 33.3 | 1929 | | | | | |
| 1923 | 17.5 | 20.9 | 23.6 | 25.8 | 27.0 | January | 17.4 | | 21.1 | 22.8 | 25.3 |
| 1924 | 16.6 | 19.2 | 21.3 | 22.8 | 23.5 | February | 17.4 | | 22.9 | 25.0 | 28.1 |
| 1925 | 23.0 | 24.7 | 27.5 | 29.7 | 30.0 | March | 23.9 | | 27.7 | 26.8 | 29.4 |
| 1926 | | | 27.8 | 30.6 | 32.3 | April | 25.2 | | 24.2 | 30.1 | 31.0 |
| 1927 | | | 21.1 | 25.5 | 26.9 | May | | | 25.2 | 28.2 | 30.0 |
| 1928 | 17.9 | | 21.2 | 23.7 | 25.8 | June | 21.8 | | 24.7 | 28.2 | 29.2 |
| 1929 | | | 24.5 | 26.6 | 28.3 | July | 23.5 | | 27.2 | 28.8 | 30.0 |
| | | | | | | August | 23.8 | | 27.4 | 28.2 | 30.0 |
| | | | | | | September | 21.1 | | 23.6 | 24.5 | 26.5 |
| | | | | | | October | 22.8 | | 23.5 | 24.3 | 26.1 |
| | | | | | | November | | | 23.2 | 25.4 | 26.6 |
| | | | | | | December | | | 23.9 | 26.1 | 27.8 |

Bureau of Agricultural Economics. Compiled from Agricultural Market Report, Ministry of Agriculture and Fisheries, Great Britain. Average for the last week of each month 1909-1923. Average of weekly averages 1924-1929. Converted at monthly average rate of exchange as given in Federal Reserve Bulletins to December, 1923, inclusive; subsequently at par of exchange.

¹ Entire half of hog in one piece, head off, backbone out, ribs in.

NOTE.—A table similar to Table 396, 1928 Yearbook, British pork prices, is omitted.

TABLE 392.—*Hogs: Cholera-control work by Bureau of Animal Industry, 1919-1929*

| Year ended June 30, and State | Bureau veteri- narians engaged in work ¹ | Premises investi- gated | Demonstrations | | Autop- sies per- formed | Farms quaran- tined or carded | Farms cleaned and dis- infected | Out- breaks reported |
|----------------------------------|---|-------------------------------|----------------|-----------------|-------------------------------|--|--|----------------------------|
| | | | Number | Hogs treated | | | | |
| 1919..... | 180 | 93, 512 | ----- | 233, 987 | 53, 586 | 9, 564 | 4, 382 | 12, 336 |
| 1920..... | 140 | 46, 145 | 3, 037 | 347, 702 | 10, 963 | 6, 129 | 2, 099 | 9, 788 |
| 1921..... | 54 | 29, 433 | 3, 420 | 67, 295 | 3, 888 | 2, 268 | 656 | 7, 951 |
| 1922..... | 80 | 47, 137 | 4, 343 | 88, 846 | 5, 390 | 1, 401 | 439 | 7, 920 |
| 1923..... | 71 | 52, 348 | 5, 234 | 108, 562 | 5, 247 | 1, 772 | 741 | 7, 204 |
| 1924..... | 45 | 29, 443 | 3, 178 | 78, 007 | 3, 686 | 1, 634 | 847 | 7, 225 |
| 1925..... | 34 | 24, 060 | 2, 353 | 51, 331 | 2, 383 | 886 | 470 | 3, 437 |
| 1926..... | 35 | 20, 599 | 2, 579 | 69, 230 | 2, 446 | 854 | 247 | 4, 558 |
| 1927..... | 36. 96 | 25, 004 | 4, 863 | 97, 917 | 3, 741 | 1, 332 | 744 | 11, 555 |
| 1928..... | 38. 42 | 25, 156 | 4, 444 | 106, 906 | 3, 368 | 1, 117 | 522 | 6, 941 |
| 1929 | | | | | | | | |
| Alabama..... | 1 | 1, 376 | 36 | 486 | 23 | ----- | ----- | 8 |
| Arkansas..... | 1. 5 | 1, 006 | 93 | 1, 110 | 41 | ----- | 17 | 875 |
| California..... | . 25 | 75 | 6 | 518 | 49 | 5 | ----- | 41 |
| Colorado..... | . 25 | 100 | 1 | 38 | 50 | ----- | ----- | 13 |
| Florida..... | 1. 25 | 985 | 652 | 12, 793 | 84 | ----- | ----- | 240 |
| Georgia..... | 1. 3 | 1, 123 | 164 | 3, 111 | 94 | ----- | ----- | 311 |
| Idaho..... | 1 | 879 | 21 | 740 | 64 | 29 | 7 | 31 |
| Illinois..... | 3 | 2, 211 | 22 | 886 | 723 | 313 | 393 | 962 |
| Indiana..... | 2 | 1, 046 | 1 | 250 | 207 | 30 | ----- | 146 |
| Iowa..... | 2 | 645 | 10 | 721 | 198 | ----- | ----- | 504 |
| Kansas..... | 1 | 1, 374 | 12 | 126 | 46 | ----- | ----- | 39 |
| Kentucky..... | 2 | 2, 232 | 102 | 5, 930 | 200 | 9 | 10 | 179 |
| Louisiana..... | 1 | 400 | 35 | 1, 239 | 31 | ----- | ----- | 60 |
| Maryland..... | 2 | 2, 928 | 26 | 614 | 195 | 652 | 3 | 956 |
| Michigan..... | 2 | 581 | 30 | 1, 586 | 146 | ----- | 1 | 298 |
| Mississippi..... | 1. 03 | 1, 819 | 200 | 3, 304 | 25 | ----- | ----- | 23 |
| Missouri..... | 1 | 943 | 22 | 898 | 107 | ----- | ----- | 312 |
| Nebraska..... | . 5 | 509 | ----- | ----- | 216 | ----- | ----- | 86 |
| North Carolina..... | 2 | 1, 169 | 227 | 4, 349 | 125 | 166 | 26 | 89 |
| Ohio..... | 1 | 468 | 11 | 665 | 69 | ----- | ----- | 258 |
| Oklahoma..... | 2 | 1, 904 | 21 | 1, 043 | 107 | 86 | ----- | 167 |
| South Carolina..... | 1 | 660 | 652 | 10, 516 | 27 | ----- | ----- | 591 |
| South Dakota..... | 1 | 374 | ----- | ----- | 77 | ----- | ----- | 69 |
| Tennessee..... | 1 | 877 | 50 | 1, 324 | 78 | 99 | 16 | 143 |
| Texas..... | . 83 | 656 | 1 | 60 | 9 | ----- | ----- | 145 |
| Virginia..... | 1 | 894 | 28 | 840 | 96 | ----- | 9 | 157 |
| Washington..... | 1 | 721 | 1 | 240 | 56 | 14 | ----- | 44 |
| Oregon..... | . 5 | 137 | 16 | 522 | 9 | 8 | 4 | 21 |
| West Virginia..... | 1 | 440 | 57 | 995 | 63 | 10 | ----- | 183 |
| Wisconsin..... | 1 | 406 | 61 | 1, 132 | 111 | 60 | 3 | 78 |
| Total..... | 37. 41 | 28, 939 | 2, 648 | 56, 023 | 3, 326 | 1, 481 | 489 | 7, 029 |

Bureau of Animal Industry.

¹ Fractions in the number of veterinarians engaged denote part time devoted to hog-cholera-control work.

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TABLE 393.—Hogs: Shipments and slaughter, by States, average 1924-1928, annual, 1928

| State and division | Average 1924-1928 ¹ | | | | | | 1928 ¹ | | | | | |
|---------------------|--------------------------------|-----------------|---|-----------------|----------------|-----------------|-------------------------------|-----------------|---|---------------|----------------|-----------------|
| | Shipments and local slaughter | | In shipments, stocker, feeder, and breeding | | Farm slaughter | | Shipments and local slaughter | | In shipments, stocker, feeder, and breeding | | Farm slaughter | |
| | Head | Weight per head | Head | Weight per head | Head | Weight per head | Head | Total weight | Head | Total weight | Head | Total weight |
| | Thou- sands | Lbs. | Thou- sands | Lbs. | Thou- sands | Lbs. | Thou- sands | 1,000 pounds | Thou- sands | 1,000 lbs. | Thou- sands | 1,000 pounds |
| Maine..... | 35 | 257 | 0.4 | 100 | 41 | 258 | 39 | 10,140 | 1 | 100 | 42 | 11,340 |
| New Hampshire..... | 8 | 256 | .8 | 100 | 13 | 258 | 8 | 2,080 | 1 | 100 | 14 | 3,790 |
| Vermont..... | 27 | 252 | ..... | ..... | 38 | 250 | 37 | 9,250 | ..... | ..... | 43 | 10,750 |
| Massachusetts..... | 50 | 257 | 2 | 100 | 42 | 254 | 76 | 19,760 | 3 | 300 | 45 | 11,700 |
| Rhode Island..... | 4 | 250 | ..... | ..... | 3 | 250 | 4 | 1,000 | ..... | ..... | 3 | 750 |
| Connecticut..... | 5 | 255 | ..... | ..... | 20 | 254 | 7 | 1,820 | ..... | ..... | 23 | 5,980 |
| New York..... | 110 | 215 | 3 | 100 | 302 | 250 | 133 | 30,500 | 6 | 600 | 309 | 70,500 |
| New Jersey..... | 42 | 200 | 11 | 125 | 42 | 247 | 44 | 8,800 | 17 | 2,125 | 45 | 11,250 |
| Pennsylvania..... | 407 | 230 | 3 | 100 | 524 | 260 | 260 | 101,200 | 3 | 300 | 550 | 143,000 |
| North Atlantic..... | 698 | 235 | 20 | 114 | 1,024 | 255 | 788 | 184,640 | 31 | 3,525 | 1,065 | 269,060 |
| Ohio..... | 2,663 | 220 | 30 | 110 | 658 | 258 | 2,630 | 589,500 | 6 | 660 | 673 | 168,250 |
| Indiana..... | 3,604 | 225 | 51 | 120 | 576 | 254 | 4,012 | 922,760 | 33 | 3,960 | 580 | 145,000 |
| Illinois..... | 5,648 | 235 | 60 | 105 | 680 | 250 | 5,939 | 1,414,482 | 41 | 4,715 | 680 | 170,000 |
| Michigan..... | 892 | 203 | 25 | 104 | 272 | 240 | 849 | 166,404 | 17 | 1,955 | 264 | 59,400 |
| Wisconsin..... | 2,000 | 217 | 2 | 100 | 448 | 233 | 2,022 | 444,840 | 2 | 200 | 470 | 105,750 |
| Minnesota..... | 4,643 | 225 | 49 | 107 | 380 | 240 | 4,520 | 1,172,600 | 41 | 4,510 | 380 | 91,200 |
| Iowa..... | 12,049 | 237 | 107 | 106 | 518 | 250 | 12,820 | 3,013,400 | 100 | 11,500 | 500 | 120,000 |
| Missouri..... | 4,346 | 217 | 43 | 92 | 820 | 244 | 4,825 | 1,085,625 | 47 | 5,170 | 850 | 212,500 |
| North Dakota..... | 805 | 226 | .8 | 100 | 218 | 238 | 743 | 170,890 | ..... | ..... | 218 | 50,140 |
| South Dakota..... | 2,973 | 226 | 8 | 109 | 164 | 239 | 3,156 | 725,880 | 12 | 1,380 | 170 | 39,950 |
| Nebraska..... | 5,582 | 246 | 79 | 110 | 272 | 251 | 5,968 | 1,486,272 | 165 | 18,975 | 275 | 67,375 |
| Kansas..... | 2,641 | 222 | 27 | 108 | 353 | 252 | 2,751 | 646,485 | 55 | 6,325 | 360 | 91,800 |
| North Central..... | 47,935 | 230 | 483 | 107 | 5,357 | 247.50 | 225 | 11,839,138 | 519 | 59,350 | 5,420 | 1,321,365 |
| Delaware..... | 17 | 190 | ..... | ..... | 17 | 192 | 20 | 3,800 | ..... | ..... | 16 | 3,200 |
| Maryland..... | 78 | 100 | ..... | ..... | 154 | 231 | 119 | 19,040 | ..... | ..... | 145 | 34,800 |
| Virginia..... | 235 | 197 | 2 | 100 | 484 | 216 | 200 | 42,600 | 3 | 300 | 556 | 133,440 |
| West Virginia..... | 89 | 170 | 2 | 102 | 202 | 220 | 129 | 21,450 | 1 | 100 | 210 | 52,500 |
| North Carolina..... | 145 | 200 | ..... | ..... | 907 | 228 | 201 | 40,200 | ..... | ..... | 935 | 205,700 |
| South Carolina..... | 144 | 200 | ..... | ..... | 432 | 208 | 90 | 18,000 | ..... | ..... | 445 | 97,900 |
| Georgia..... | 416 | 150 | 4 | 100 | 967 | 220 | 510 | 76,500 | ..... | ..... | 1,040 | 228,800 |
| Florida..... | 260 | 131 | ..... | ..... | 321 | 146 | 246 | 34,440 | ..... | ..... | 335 | 46,900 |
| South Atlantic..... | 1,383 | 167 | 4 | 101 | 3,514 | 214 | 1,515 | 256,030 | 4 | 400 | 3,682 | 893,240 |
| Kentucky..... | 707 | 190 | 9 | 75 | 820 | 250 | 783 | 138,975 | 5 | 375 | 645 | 161,250 |
| Tennessee..... | 493 | 188 | 7 | 125 | 795 | 212 | 532 | 102,730 | 5 | 625 | 810 | 186,300 |
| Alabama..... | 153 | 186 | 1 | 130 | 720 | 230 | 231 | 39,560 | 1 | 150 | 735 | 147,000 |
| Mississippi..... | 110 | 150 | .8 | 100 | 618 | 200 | 105 | 15,750 | 2 | 280 | 680 | 136,000 |
| Arkansas..... | 202 | 150 | 2 | 100 | 659 | 200 | 250 | 37,500 | 6 | 600 | 668 | 133,600 |
| Louisiana..... | 118 | 170 | 4 | 119 | 331 | 160 | 95 | 14,250 | 6 | 600 | 321 | 51,300 |
| Oklahoma..... | 610 | 204 | 12 | 100 | 441 | 252 | 848 | 173,636 | 14 | 1,260 | 379 | 94,750 |
| Texas..... | 621 | 211 | 21 | 100 | 777 | 254 | 734 | 154,555 | 13 | 1,300 | 800 | 208,000 |
| South Central..... | 3,014 | 192 | 56 | 98 | 4,960 | 223 | 3,578 | 676,956 | 52 | 5,190 | 5,038 | 1,118,200 |
| Montana..... | 246 | 200 | 1 | 100 | 122 | 220 | 233 | 46,600 | ..... | ..... | 124 | 27,280 |
| Idaho..... | 327 | 190 | .6 | 117 | 66 | 247 | 317 | 60,230 | 1 | 100 | 70 | 16,450 |
| Wyoming..... | 106 | 182 | .8 | 100 | 32 | 234 | 132 | 25,080 | 1 | 100 | 35 | 8,050 |
| Colorado..... | 498 | 226 | 8 | 100 | 88 | 240 | 500 | 113,425 | 15 | 1,500 | 90 | 20,790 |
| New Mexico..... | 38 | 200 | .4 | 100 | 31 | 234 | 40 | 8,000 | ..... | ..... | 30 | 6,000 |
| Arizona..... | 18 | 200 | .2 | 100 | 10 | 198 | 19 | 3,800 | ..... | ..... | 10 | 1,900 |
| Utah..... | 52 | 164 | 2 | 100 | 47 | 200 | 33 | 5,910 | 3 | 300 | 45 | 9,000 |
| Nevada..... | 29 | 173 | ..... | ..... | 12 | 200 | 33 | 5,910 | ..... | ..... | 16 | 3,200 |
| Washington..... | 163 | 210 | 17 | 100 | 106 | 228 | 193 | 40,855 | 20 | 2,000 | 110 | 24,200 |
| Oregon..... | 240 | 200 | 17 | 125 | 98 | 218 | 279 | 55,921 | 17 | 2,125 | 108 | 22,680 |
| California..... | 592 | 187 | 4 | 100 | 112 | 209 | 753 | 138,540 | 5 | 500 | 120 | 24,600 |
| Far Western..... | 2,307 | 200 | 50 | 109 | 722 | 223 | 2,580 | 510,511 | 62 | 6,625 | 758 | 164,150 |
| United States..... | 55,326 | 225 | 614 | 107 | 15,579 | 231 | 58,696 | 13,467,275 | 668 | 75,090 | 15,963 | 3,676,065 |

Bureau of Agricultural Economics. Estimates division crop and livestock estimates.

¹ Preliminary.

TABLE 394.—Hogs: Value of production and income, average 1924-1928, annual, 1928

| State | Average 1924-1928 ¹ | | | | 1928 ¹ | | | |
|---------------------|-----------------------------------|---------------------|---------------|---------------------|-----------------------------------|---------------------|---------------|---------------------|
| | Value of amount consumed on farms | Receipts from sales | Gross income | Value of production | Value of amount consumed on farms | Receipts from sales | Gross income | Value of production |
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Maine..... | 568 | 1,656 | 2,224 | 2,055 | 544 | 1,621 | 2,165 | 1,876 |
| New Hampshire..... | 168 | 451 | 619 | 616 | 162 | 415 | 577 | 536 |
| Vermont..... | 434 | 1,308 | 1,743 | 1,586 | 460 | 1,515 | 1,975 | 1,730 |
| Massachusetts..... | 582 | 2,107 | 2,680 | 2,601 | 562 | 2,593 | 3,155 | 2,918 |
| Rhode Island..... | 40 | 152 | 192 | 173 | 40 | 159 | 199 | 187 |
| Connecticut..... | 292 | 486 | 778 | 704 | 320 | 572 | 892 | 783 |
| New York..... | 4,435 | 7,476 | 11,912 | 10,682 | 3,761 | 6,900 | 10,661 | 8,981 |
| New Jersey..... | 712 | 1,362 | 2,074 | 1,906 | 700 | 1,231 | 1,931 | 1,665 |
| Pennsylvania..... | 10,020 | 16,353 | 26,373 | 23,845 | 9,389 | 15,896 | 25,285 | 21,888 |
| North Atlantic..... | 17,252 | 31,352 | 48,604 | 44,168 | 15,938 | 30,902 | 46,840 | 40,559 |
| Ohio..... | 15,146 | 61,905 | 77,051 | 74,272 | 13,321 | 56,161 | 69,482 | 63,862 |
| Indiana..... | 13,969 | 82,301 | 96,270 | 93,938 | 12,244 | 84,567 | 96,811 | 91,052 |
| Illinois..... | 15,116 | 130,836 | 145,953 | 142,740 | 13,311 | 124,502 | 137,813 | 130,989 |
| Michigan..... | 4,212 | 20,487 | 24,699 | 22,948 | 3,444 | 17,049 | 20,493 | 17,938 |
| Wisconsin..... | 7,954 | 45,658 | 53,612 | 52,407 | 7,191 | 40,128 | 47,319 | 43,514 |
| Minnesota..... | 7,153 | 98,626 | 105,780 | 105,081 | 6,510 | 98,262 | 104,772 | 99,552 |
| Iowa..... | 12,211 | 269,584 | 281,795 | 277,118 | 9,996 | 255,254 | 265,250 | 253,492 |
| Missouri..... | 17,638 | 92,365 | 110,002 | 108,461 | 16,630 | 94,980 | 111,610 | 108,364 |
| North Dakota..... | 4,227 | 16,952 | 21,179 | 20,520 | 3,650 | 14,140 | 17,790 | 16,962 |
| South Dakota..... | 3,441 | 62,066 | 65,507 | 63,930 | 3,055 | 58,510 | 61,565 | 56,680 |
| Nebraska..... | 6,189 | 126,161 | 132,351 | 130,492 | 5,385 | 120,838 | 126,223 | 118,168 |
| Kansas..... | 8,016 | 56,421 | 64,437 | 63,706 | 7,342 | 55,678 | 63,020 | 61,946 |
| North Central..... | 115,273 | 1,063,363 | 1,178,636 | 1,155,611 | 102,079 | 1,020,069 | 1,122,148 | 1,062,519 |
| Delaware..... | 227 | 534 | 761 | 706 | 193 | 537 | 730 | 665 |
| Maryland..... | 3,061 | 2,242 | 5,304 | 5,055 | 2,762 | 2,708 | 5,470 | 5,012 |
| Virginia..... | 8,904 | 7,033 | 15,936 | 15,160 | 10,300 | 6,673 | 16,973 | 15,586 |
| West Virginia..... | 3,682 | 2,835 | 6,517 | 5,575 | 4,023 | 3,460 | 7,463 | 6,800 |
| North Carolina..... | 18,779 | 7,319 | 26,098 | 24,376 | 19,009 | 8,342 | 27,351 | 23,527 |
| South Carolina..... | 8,525 | 3,518 | 12,043 | 10,935 | 8,634 | 2,461 | 11,265 | 10,389 |
| Georgia..... | 17,944 | 8,228 | 26,171 | 25,000 | 16,226 | 8,372 | 24,598 | 22,363 |
| Florida..... | 2,440 | 5,008 | 7,448 | 6,841 | 2,111 | 4,412 | 6,523 | 5,877 |
| South Atlantic..... | 63,563 | 36,716 | 100,278 | 93,648 | 63,458 | 36,965 | 100,423 | 90,419 |
| Kentucky..... | 13,443 | 15,717 | 29,161 | 27,649 | 12,275 | 14,506 | 26,781 | 24,073 |
| Tennessee..... | 13,948 | 11,587 | 25,535 | 23,796 | 13,298 | 11,280 | 24,578 | 22,145 |
| Alabama..... | 12,672 | 5,108 | 17,780 | 17,127 | 9,608 | 5,026 | 14,634 | 13,299 |
| Mississippi..... | 8,849 | 3,892 | 12,741 | 11,891 | 8,476 | 3,500 | 12,066 | 10,238 |
| Arkansas..... | 8,950 | 5,047 | 13,997 | 13,509 | 8,326 | 5,171 | 13,497 | 11,871 |
| Louisiana..... | 3,694 | 2,700 | 6,484 | 5,973 | 3,328 | 2,098 | 5,426 | 4,981 |
| Oklahoma..... | 9,394 | 11,700 | 21,093 | 20,528 | 7,214 | 14,542 | 21,756 | 20,260 |
| Texas..... | 16,061 | 14,503 | 30,585 | 29,231 | 14,643 | 14,836 | 29,479 | 27,218 |
| South Central..... | 87,011 | 70,344 | 157,356 | 149,703 | 77,168 | 71,049 | 148,217 | 134,065 |
| Montana..... | 1,852 | 5,237 | 7,089 | 6,999 | 1,721 | 4,574 | 6,295 | 6,601 |
| Idaho..... | 1,362 | 6,185 | 7,547 | 7,336 | 1,217 | 5,427 | 6,644 | 6,078 |
| Wyoming..... | 547 | 1,802 | 2,349 | 2,403 | 536 | 2,173 | 2,708 | 2,814 |
| Colorado..... | 1,662 | 10,846 | 12,508 | 12,329 | 1,501 | 10,115 | 11,616 | 11,703 |
| New Mexico..... | 518 | 789 | 1,307 | 1,279 | 398 | 747 | 1,145 | 1,074 |
| Arizona..... | 122 | 453 | 575 | 543 | 126 | 495 | 621 | 598 |
| Utah..... | 687 | 1,062 | 1,749 | 1,720 | 595 | 1,270 | 1,865 | 1,804 |
| Nevada..... | 200 | 570 | 770 | 758 | 237 | 588 | 825 | 804 |
| Washington..... | 1,435 | 4,858 | 6,293 | 6,005 | 1,291 | 4,992 | 6,263 | 5,752 |
| Oregon..... | 1,272 | 5,733 | 7,006 | 6,785 | 1,231 | 6,031 | 7,262 | 6,836 |
| California..... | 1,840 | 12,759 | 14,599 | 14,342 | 1,718 | 14,250 | 15,968 | 15,806 |
| Far Western..... | 11,499 | 50,292 | 61,791 | 60,508 | 10,570 | 50,662 | 61,232 | 59,872 |
| United States..... | 294,598 | 1,252,067 | 1,546,665 | 1,503,639 | 269,213 | 1,209,647 | 1,478,860 | 1,387,454 |

Bureau of Agricultural Economics. Estimates division crop and livestock estimates.

¹ Preliminary.

TABLE 395.—*Sheep: Number and value per head in the United States, 1840, 1850, 1860, 1867-1929*

| Year | On farms | | On farms and elsewhere Jan. 1 ² | Year | On farms | | On farms and elsewhere Jan. 1 ² |
|-------------------|---------------------|-----------------------|--|-------------------|---------------------|-----------------------|--|
| | Number ¹ | Value per head Jan. 1 | | | Number ¹ | Value per head Jan. 1 | |
| | Thousands | Dollars | Thousands | | Thousands | Dollars | Thousands |
| 1840 ³ | 19,511 | | | 1898 | 37,657 | 2.46 | 42,600 |
| 1850 ³ | 21,723 | | 29,100 | 1899 | 39,114 | 2.75 | 44,600 |
| 1860 ³ | 22,471 | | 27,600 | 1900 | 41,883 | 2.93 | 48,100 |
| 1867 | 39,385 | 2.50 | 38,100 | 1900 ³ | 61,504 | | |
| 1868 | 38,902 | 1.82 | 37,600 | 1900 | 44,573 | | 44,804 |
| 1869 | 37,724 | 1.64 | 36,200 | 1901 | 46,155 | 2.98 | 46,395 |
| 1870 ³ | 28,478 | | | 1902 | 46,667 | 2.65 | 46,910 |
| 1870 | 40,853 | 1.96 | 39,000 | 1903 | 45,180 | 2.63 | 45,415 |
| 1871 | 31,815 | 2.14 | 38,900 | 1904 | 42,439 | 2.59 | 42,680 |
| 1872 | 31,679 | 2.61 | 38,600 | 1905 | 40,268 | 2.82 | 40,477 |
| 1873 | 33,002 | 2.71 | 40,100 | 1906 | 42,454 | 3.54 | 42,675 |
| 1874 | 33,938 | 2.43 | 41,100 | 1907 | 44,518 | 3.84 | 44,749 |
| 1875 | 33,784 | 2.55 | 40,800 | 1908 | 46,557 | 3.88 | 46,799 |
| 1876 | 35,935 | 2.37 | 43,300 | 1909 | 48,382 | 3.43 | 48,634 |
| 1877 | 35,804 | 2.13 | 43,000 | 1910 ³ | 58,448 | | |
| 1878 | 35,740 | 2.21 | 42,800 | 1910 | 47,072 | 4.12 | 47,463 |
| 1879 | 38,124 | 2.07 | 45,500 | 1911 | 47,349 | 3.91 | 47,742 |
| 1880 ³ | 55,192 | | | 1912 | 43,279 | 3.46 | 43,638 |
| 1880 | 40,766 | 2.21 | 48,500 | 1913 | 40,700 | 3.94 | 41,038 |
| 1881 | 43,570 | 2.39 | 51,200 | 1914 | 37,773 | 4.02 | 38,067 |
| 1882 | 45,016 | 2.37 | 52,300 | 1915 | 36,287 | 4.50 | 36,588 |
| 1883 | 49,237 | 2.53 | 56,600 | 1916 | 36,543 | 5.17 | 36,846 |
| 1884 | 50,627 | 2.37 | 57,500 | 1917 | 36,700 | 7.13 | 37,005 |
| 1885 | 50,360 | 2.14 | 56,500 | 1918 | 39,000 | 11.82 | 39,324 |
| 1886 | 48,322 | 1.91 | 53,600 | 1919 | 41,000 | 11.63 | 41,340 |
| 1887 | 44,759 | 2.01 | 49,100 | 1920 ³ | 55,034 | | |
| 1888 | 43,545 | 2.05 | 47,200 | 1920 | 40,243 | 10.46 | 40,694 |
| 1889 | 42,599 | 2.13 | 45,700 | 1921 | 38,690 | 6.28 | 39,123 |
| 1890 ³ | 55,955 | | | 1922 | 36,186 | 4.80 | 36,591 |
| 1890 | 44,336 | 2.27 | 47,000 | 1923 | 36,212 | 7.53 | 36,618 |
| 1891 | 43,431 | 2.50 | 46,400 | 1924 | 36,876 | 7.91 | 37,289 |
| 1892 | 44,938 | 2.58 | 48,400 | 1925 ³ | 55,590 | | |
| 1893 | 47,274 | 2.66 | 51,300 | 1925 | 38,112 | 9.70 | 38,539 |
| 1894 | 45,048 | 1.98 | 49,300 | 1926 | 39,730 | 10.51 | 40,175 |
| 1895 | 42,294 | 1.58 | 46,700 | 1927 | 41,881 | 9.71 | 42,350 |
| 1896 | 38,299 | 1.70 | 42,600 | 1928 | 44,554 | 10.25 | 45,063 |
| 1897 | 36,819 | 1.82 | 41,300 | 1929 | 47,171 | 10.60 | 47,699 |

Bureau of Agricultural Economics. Later revised figures for 1928, 1929, and preliminary for 1930 may be found in February, 1930, Crops and Markets.

¹ Prior to 1900 estimates for each 10-year period represent an index of annual changes applied to census as base on first report after census data were available. Figures 1900-1919 are tentative revised estimates of the Bureau of Agricultural Economics as first published in 1927 Yearbook.

² Data for sheep on farms and elsewhere as of Jan. 1, prior to 1900, estimated by the Bureau of Animal Industry. Census figures prior to 1920 were adjusted to a Jan. 1 basis and to include all ages and all animals in towns, villages, and ranges, as well as on farms. For methods see Department Circular 241. Figures from 1900-1929 are the estimates of the Bureau of Agricultural Economics of sheep on farms plus an estimate made by the Bureau of Animal Industry of sheep in towns and villages.

³ Italic figures are from the census. Figures for census years 1860, 1880, and 1890 exclude an estimated number of unenumerated sheep on ranges, as follows: 1860, 1,505,810; 1880, 7,000,000; 1890, 4,940,948. Censuses prior to 1900 excluded lambs. Census dates were June 1 from 1840 to 1900; Apr. 15, 1910; Jan. 1, 1920 and 1925.

⁴ Original estimate of the Bureau of Agricultural Economics.

⁵ Preliminary.

TABLE 398.—*Sheep and lambs: Estimated number on farms and value per head, by States, January 1, 1925-1929*

| State and division | Number | | | | | Value per head ¹ | | | | |
|---------------------|----------------|----------------|----------------|----------------|-------------------|-----------------------------|---------|---------|---------|-------------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 ² | 1925 | 1926 | 1927 | 1928 | 1929 ² |
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Dollars | Dollars | Dollars | Dollars | Dollars |
| Maine..... | 89 | 95 | 92 | 92 | 93 | 7.60 | 8.00 | 8.30 | 8.50 | 8.40 |
| New Hampshire..... | 18 | 19 | 20 | 21 | 21 | 8.10 | 8.60 | 9.00 | 9.50 | 9.60 |
| Vermont..... | 40 | 43 | 43 | 44 | 45 | 8.30 | 8.90 | 9.40 | 9.30 | 9.00 |
| Massachusetts..... | 12 | 11 | 11 | 11 | 11 | 9.70 | 9.40 | 9.80 | 10.60 | 10.00 |
| Rhode Island..... | 2 | 2 | 2 | 2 | 2 | 10.00 | 9.50 | 10.00 | 10.50 | 11.00 |
| Connecticut..... | 8 | 8 | 7 | 8 | 8 | 9.40 | 10.20 | 10.40 | 10.80 | 11.90 |
| New York..... | 473 | 497 | 477 | 491 | 452 | 10.60 | 11.60 | 10.80 | 11.10 | 11.50 |
| New Jersey..... | 6 | 6 | 6 | 6 | 6 | 9.50 | 10.80 | 11.80 | 12.20 | 11.50 |
| Pennsylvania..... | 415 | 415 | 400 | 437 | 441 | 8.80 | 9.70 | 9.40 | 9.50 | 9.60 |
| North Atlantic..... | 1,063 | 1,096 | 1,058 | 1,112 | 1,079 | 9.52 | 10.35 | 9.98 | 10.16 | 10.30 |
| Ohio..... | 1,941 | 2,000 | 2,133 | 2,133 | 2,154 | 8.90 | 9.50 | 8.50 | 8.90 | 9.00 |
| Indiana..... | 595 | 647 | 731 | 705 | 725 | 10.60 | 11.50 | 10.10 | 11.00 | 11.20 |
| Illinois..... | 556 | 710 | 800 | 630 | 664 | 10.40 | 11.30 | 10.00 | 10.60 | 10.80 |
| Michigan..... | 1,066 | 1,173 | 1,314 | 1,314 | 1,380 | 11.20 | 12.00 | 10.40 | 10.90 | 11.00 |
| Wisconsin..... | 360 | 401 | 469 | 430 | 450 | 10.20 | 11.00 | 9.60 | 10.20 | 10.40 |
| Minnesota..... | 462 | 540 | 628 | 666 | 686 | 10.60 | 11.20 | 9.70 | 10.50 | 10.80 |
| Iowa..... | 870 | 913 | 1,047 | 939 | 1,096 | 11.20 | 11.80 | 10.20 | 10.80 | 11.00 |
| Missouri..... | 894 | 940 | 986 | 942 | 987 | 9.40 | 10.00 | 9.70 | 10.10 | 10.60 |
| North Dakota..... | 311 | 373 | 460 | 529 | 582 | 9.90 | 11.20 | 10.20 | 10.70 | 11.00 |
| South Dakota..... | 682 | 700 | 749 | 809 | 890 | 10.50 | 10.80 | 9.90 | 10.60 | 10.50 |
| Nebraska..... | 780 | 810 | 684 | 905 | 1,050 | 10.50 | 10.30 | 8.70 | 9.10 | 9.50 |
| Kansas..... | 384 | 452 | 475 | 512 | 538 | 9.10 | 9.80 | 9.40 | 9.40 | 9.20 |
| North Central..... | 8,901 | 9,659 | 10,476 | 10,514 | 11,203 | 10.10 | 10.71 | 9.59 | 10.09 | 10.27 |
| Delaware..... | 2 | 2 | 2 | 2 | 2 | 10.00 | 10.00 | 10.00 | 12.00 | 11.50 |
| Maryland..... | 92 | 96 | 98 | 101 | 108 | 9.50 | 10.40 | 10.30 | 11.60 | 11.50 |
| Virginia..... | 351 | 362 | 380 | 426 | 469 | 8.90 | 10.10 | 10.30 | 11.50 | 11.80 |
| West Virginia..... | 485 | 485 | 500 | 565 | 593 | 8.20 | 9.40 | 10.10 | 10.90 | 11.00 |
| North Carolina..... | 67 | 73 | 80 | 85 | 89 | 6.20 | 6.60 | 7.40 | 9.00 | 9.00 |
| South Carolina..... | 14 | 13 | 14 | 15 | 15 | 4.40 | 4.10 | 4.90 | 4.90 | 4.90 |
| Georgia..... | 51 | 51 | 51 | 46 | 48 | 3.40 | 3.20 | 3.60 | 3.80 | 4.00 |
| Florida..... | 60 | 59 | 59 | 59 | 59 | 3.30 | 3.00 | 3.20 | 3.60 | 4.30 |
| South Atlantic..... | 1,122 | 1,141 | 1,184 | 1,299 | 1,383 | 7.90 | 8.85 | 9.31 | 10.38 | 10.59 |
| Kentucky..... | 715 | 751 | 871 | 958 | 996 | 8.90 | 10.10 | 10.70 | 11.20 | 11.40 |
| Tennessee..... | 292 | 286 | 300 | 345 | 352 | 5.90 | 7.40 | 10.10 | 9.60 | 9.60 |
| Alabama..... | 57 | 48 | 53 | 66 | 79 | 4.30 | 3.90 | 3.70 | 4.40 | 4.20 |
| Mississippi..... | 114 | 108 | 76 | 45 | 38 | 2.90 | 3.00 | 3.30 | 3.40 | 3.30 |
| Arkansas..... | 52 | 49 | 54 | 54 | 50 | 3.90 | 4.80 | 5.80 | 6.10 | 6.50 |
| Louisiana..... | 109 | 105 | 102 | 107 | 110 | 3.20 | 3.00 | 3.00 | 3.00 | 3.30 |
| Oklahoma..... | 64 | 70 | 84 | 97 | 107 | 7.30 | 8.80 | 9.20 | 8.80 | 10.00 |
| Texas..... | 3,500 | 3,535 | 4,065 | 4,593 | 5,052 | 7.50 | 8.10 | 7.80 | 8.40 | 8.90 |
| South Central..... | 4,903 | 4,952 | 5,605 | 6,265 | 6,784 | 7.36 | 8.10 | 8.23 | 8.75 | 9.14 |
| Montana..... | 2,579 | 2,880 | 3,053 | 3,358 | 3,761 | 10.40 | 11.40 | 10.50 | 11.00 | 11.30 |
| Idaho..... | 1,960 | 1,880 | 1,974 | 2,110 | 2,216 | 10.90 | 11.80 | 10.80 | 11.40 | 11.90 |
| Wyoming..... | 2,700 | 2,870 | 3,100 | 3,193 | 3,448 | 10.80 | 11.50 | 10.20 | 10.60 | 11.60 |
| Colorado..... | 2,565 | 2,537 | 1,938 | 2,806 | 2,780 | 10.30 | 10.50 | 9.40 | 9.70 | 10.60 |
| New Mexico..... | 2,100 | 2,050 | 2,250 | 2,362 | 2,362 | 8.50 | 9.50 | 8.70 | 9.00 | 10.30 |
| Arizona..... | 1,164 | 1,220 | 1,230 | 1,132 | 1,109 | 8.20 | 8.90 | 9.10 | 9.50 | 9.70 |
| Utah..... | 2,355 | 2,472 | 2,650 | 2,730 | 2,866 | 11.30 | 12.00 | 10.80 | 11.20 | 11.50 |
| Nevada..... | 1,100 | 1,175 | 1,198 | 1,234 | 1,259 | 11.00 | 11.70 | 10.60 | 11.00 | 10.80 |
| Washington..... | 516 | 478 | 526 | 552 | 574 | 11.20 | 12.10 | 11.00 | 11.50 | 12.00 |
| Oregon..... | 2,039 | 2,120 | 2,247 | 2,359 | 2,501 | 10.40 | 11.50 | 10.40 | 11.20 | 11.50 |
| California..... | 3,045 | 3,200 | 3,392 | 3,528 | 3,846 | 9.20 | 10.60 | 10.00 | 11.40 | 10.80 |
| Far Western..... | 22,123 | 22,882 | 23,558 | 25,364 | 26,722 | 10.15 | 11.04 | 10.12 | 10.68 | 11.12 |
| United States..... | 38,112 | 39,730 | 41,881 | 44,554 | 47,171 | 9.70 | 10.51 | 9.71 | 10.25 | 10.00 |

Bureau of Agricultural Economics. Estimates of crop-reporting board. Later revised figures for 1928, 1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Sum of total value of classes divided by total number and rounded to nearest dime for States. Division and the United States averages not rounded.

² Preliminary.

TABLE 397.—*Sheep: Number in countries having 100,000 and over, average 1909-1913 and 1921-1925, annual 1926-1929*

| Country | Month of estimate | Average 1909-1913 ¹ | Average 1921-1925 ¹ | 1926 | 1927 | 1928 | 1929 |
|---|-----------------------|--------------------------------|--------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| NORTH AMERICA AND WEST INDIES | | | | | | | |
| Canada | June | Thou- sands 2,208 | Thou- sands 3,027 | Thou- sands 3,142 | Thou- sands 3,283 | Thou- sands 3,416 | Thou- sands 3,728 |
| United States | January | 43,235 | 37,215 | 39,730 | 41,681 | 44,795 | 47,600 |
| Mexico | June | ² 3,424 | ⁴ 1,362 | 2,698 | | | |
| Guatemala | | 514 | 153 | | 216 | 241 | |
| Dominican Republic | | (134) | 148 | | | | |
| Estimated total ³ | | 49,800 | 42,200 | | | | |
| SOUTH AMERICA | | | | | | | |
| Colombia | | ⁶ 246 | 776 | 800 | 771 | | |
| Venezuela | | 177 | 113 | | | | |
| Ecuador | | | 500 | 700 | | | 7 700 |
| Peru | | | 11,363 | | 7 12,000 | | |
| Bolivia | December ⁸ | 1,750 | 3,436 | 4,300 | | 4,152 | |
| Chile | | 3,477 | 4,332 | ⁹ 4,094 | | | |
| Brazil | September | 10,550 | ¹⁰ 7,933 | | | | |
| Uruguay | | ¹¹ 26,286 | ³ 14,443 | | | | 19,358 |
| Paraguay | December ⁸ | ¹² 600 | | | | | |
| Argentina | | ¹³ 43,225 | ¹⁴ 36,209 | | ⁷ 38,000 | | |
| Falkland Islands | do | 711 | 649 | 606 | 607 | | |
| Estimated total ⁵ | | 93,200 | 80,400 | | | | |
| EUROPE | | | | | | | |
| Iceland | | 589 | 565 | 590 | 600 | | |
| England and Wales | June | 18,346 | 14,385 | 16,859 | 17,072 | 16,390 | 16,108 |
| Isle of Man | do | 79 | 77 | 90 | 91 | 89 | |
| Scotland | do | 7,028 | 6,827 | 7,203 | 7,536 | 7,579 | 7,498 |
| North Ireland | do | 364 | 456 | 529 | 600 | 624 | 654 |
| Irish Free State | do | 3,423 | 2,894 | 3,003 | 3,120 | 3,264 | 3,375 |
| Norway ¹⁵ | do | 1,398 | 1,380 | 1,595 | 1,608 | 1,654 | |
| Sweden | June-September | 1,205 | 1,384 | | 806 | | |
| Denmark | July | 1,533 | 380 | 233 | | | 191 |
| Faroe Islands | | 112 | 66 | | | | |
| Holland | May-June | 842 | 668 | | | | |
| Belgium | December ⁸ | 189 | 126 | | | | |
| France | do | 16,176 | 9,777 | 10,537 | 10,775 | 10,693 | 10,415 |
| Spain | do | 15,778 | 19,229 | 20,067 | 20,529 | | |
| Portugal | ¹⁷ 3,073 | 3,684 | | | 7 4,450 | 7 4,900 | |
| Italy | March-April | 11,615 | 12,014 | 7 12,350 | 7 12,500 | | |
| Switzerland | April | 161 | 245 | 169 | | | |
| Germany | December ⁸ | 4,988 | 5,889 | 4,753 | 4,080 | 3,819 | 3,630 |
| Austria | do | 301 | 526 | ⁷ 313 | | | 7 500 |
| Czechoslovakia | do | 1,322 | ¹⁰ 986 | 861 | | | |
| Hungary | April | 2,406 | 1,661 | 1,804 | 1,611 | 1,566 | 1,573 |
| Yugoslavia | January | 10,496 | 7,728 | 7,933 | 7,736 | 7,722 | 7 7,800 |
| Greece | December ⁸ | 5,884 | 5,965 | 6,636 | 6,951 | 6,442 | 6,020 |
| Bulgaria | do | 8,551 | 8,186 | | ⁸ 8,739 | 8,427 | 7,996 |
| Rumania | do | 11,128 | 11,660 | 12,950 | 13,582 | 12,941 | 12,801 |
| Poland | November | 4,473 | 2,193 | | 1,918 | | |
| Lithuania | | 1,152 | 1,314 | 1,573 | 1,365 | 1,468 | |
| Latvia | June | 996 | 1,240 | 1,153 | 1,128 | 1,090 | 7 900 |
| Estonia | July | 486 | 654 | 666 | 667 | 659 | 475 |
| Finland | September | 1,330 | 1,526 | 1,414 | 1,368 | 1,314 | |
| Russia (European and Asiatic). | Summer | ⁶ 111,051 | 93,569 | 113,865 | 119,389 | 123,810 | (¹⁹) |
| Estimated total, excluding Russia. ⁵ | | 134,400 | 123,600 | | | | |
| AFRICA | | | | | | | |
| Morocco | | 3,175 | 7,533 | 9,250 | 7,712 | 7 8,035 | |
| Algeria | September | 8,757 | 5,943 | 6,786 | 5,083 | 5,614 | 6,196 |
| Libia (Italian) | | 996 | 1,043 | | | | |
| Tunis | December ⁸ | 705 | 1,794 | 1,329 | 2,172 | 2,142 | 1,620 |
| French West Africa | | 3,742 | 4,365 | 3,968 | 4,037 | | |
| French Sudan | | 2,173 | | 2,400 | 2,424 | | |
| Gold Coast | | 250 | 373 | 325 | 350 | 400 | |
| Nigeria | | | 1,681 | 1,809 | 1,827 | 1,755 | |
| Egypt | September | 816 | 1,013 | 1,144 | 1,232 | 1,180 | |
| Anglo-Egyptian Sudan | | | 1,638 | 2,000 | 2,201 | 2,201 | |
| British Somaliland | | | | 2,000 | 2,000 | 2,000 | |
| Italian Somaliland | March | | 1,666 | | | 1,039 | 865 |
| Eritrea (Italian) ¹⁹ | | 1,585 | 1,701 | | 1,842 | | |
| Kenya Colony | March-June | 5,469 | 2,609 | 2,756 | 2,895 | 2,847 | |
| French Cameroon ¹⁹ | | (200) | 287 | 410 | 456 | 441 | |
| Uganda | December ⁸ | 612 | 386 | 604 | 866 | 911 | 967 |

See footnotes at end of table.

TABLE 397.—*Sheep: Number in countries having 100,000 and over, average 1909-1913 and 1921-1925, annual 1926-1929—Continued*

| Country | Month of estimate | Average 1909-1913 ¹ | Average 1921-1925 ¹ | 1926 | 1927 | 1928 | 1929 |
|---|-----------------------|--------------------------------|--------------------------------|------------|----------------------|------------|------------|
| AFRICA—continued | | Thou-sands | Thou-sands | Thou-sands | Thou-sands | Thou-sands | Thou-sands |
| Belgian Congo..... | | 300 | 304 | 300 | 285 | 270 | |
| British Southwest Africa..... | | 555 | 954 | 1,009 | 1,252 | | |
| Bechuanaland..... | | 358 | 125 | 132 | 152 | 152 | |
| Union of South Africa..... | August | 30,657 | 32,561 | 39,020 | 40,271 ²⁰ | 42,662 | |
| Basutoland..... | | 1,369 | 1,954 | 2,100 | 2,149 | 2,100 | |
| Rhodesia, Southern..... | December ³ | 300 | 333 | 349 | 332 | 352 | |
| Swaziland..... | | 164 | 62 | | | | |
| Tanganyika Territory ¹⁰ | | 3,596 | 3,893 | 4,462 | 4,779 | 5,062 | |
| Madagascar..... | | 318 | 110 | 116 | 66 | 142 | |
| Estimated total ⁴ | | 73,900 | 77,700 | | | | |
| ASIA | | | | | | | |
| Arabia..... | | | 237 | | 3,500 | | |
| Cyprus..... | March | 279 | | 207 | 260 | 264 | |
| Turkey, European and Asiatic..... | | 19,713 | 10,451 | 12,872 | 10,166 | | |
| Iraq (Mesopotamia) ¹⁰ | February | | 5,270 | 5,055 | | | |
| Palestine..... | March | | 271 | 291 | 243 | | |
| Persia..... | | | 7 6,562 | | 7 14,280 | 7 15,000 | 7 16,000 |
| Syria and Lebanon..... | | | 1,797 | 1,400 | 1,334 | | |
| India, British..... | December-April | 23,164 | 22,412 | 23,201 | 23,237 | 23,350 | |
| Native States..... | do | 8,638 | 12,299 | 11,848 | 12,353 | | |
| China..... | | 25,951 | | | | | 7 35,000 |
| Philippines..... | December ⁵ | 96 | 260 | 344 | 369 | 395 | |
| Dutch East Indies—Java and Madura..... | do | | 915 | | 1,292 | | |
| Outer possessions..... | do | | 115 | | 121 | | |
| Estimated total exclusive of Russia. ⁴ | | 111,700 | 106,900 | | | | |
| OCEANIA | | | | | | | |
| Australia..... | December ⁵ | 89,008 | 85,556 | 103,563 | 104,267 | 100,827 | 106,000 |
| New Zealand..... | April | 23,996 | 23,382 | 24,905 | 25,649 | 27,134 | 29,051 |
| Estimated total ⁴ | | 113,000 | 109,000 | | | | |
| Total countries reporting all periods including Russia: | | | | | | | |
| Pre-war to 1923 (40). ²¹ | | 436,113 | 398,363 | 456,886 | 466,531 | 473,856 | |
| Pre-war to 1929 (19). ²¹ | | 250,242 | 226,349 | 254,085 | 258,039 | 257,628 | 267,215 |
| Estimated world total, including Russia. ⁴ | | 687,100 | 633,400 | | | | |

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture unless otherwise stated. Figures in parentheses are interpolated.

¹ Average for 5-year period if available, otherwise for any year or years within this period except as otherwise stated. In countries having changed boundaries the pre-war figures are estimates for 1 year only of numbers within present boundaries. For the pre-war average the years immediately preceding the war have been used.

² Year 1902.

³ Census figures.

⁴ Incomplete.

⁵ These totals include countries with less than 100,000 interpolations for a few countries not reporting each year and rough estimates for some others.

⁶ Year 1916.

⁷ Unofficial.

⁸ Estimates for countries reporting as of Dec. 31, are considered as of Jan. 1 of the following year, i. e., figures for number of sheep in France as of Dec. 31, 1925, have been placed in 1926 column.

⁹ Year 1925.

¹⁰ Year 1920.

¹¹ Year 1908.

¹² Year 1915.

¹³ June, 1914.

¹⁴ December, 1922.

¹⁵ For Argentine average of range from 36,000,000 to 40,000,000, for Austria average of range from 300,000 to 325,000, and for China average of range from 25,000,000 to 45,000,000.

¹⁶ In rural communities only.

¹⁷ 1906.

¹⁸ Sheep and goats 140,689,000 against 140,102,000 in 1928. Sheep alone in 1928 given as 123,810,000. Economic Life, Aug. 14, 1929.

¹⁹ Goats included.

²⁰ Number in towns assumed to be same as in 1927, i. e., 162,000 and added for purposes of comparison with preceding years.

²¹ Comparable totals for number of countries indicated. Russia excluded from totals pre-war to 1929 as no 1929 figures are available for sheep alone.

TABLE 398.—*Sheep: Receipts at principal public stockyards and at all public stockyards, 1909-1929*

| Year | Chi- cago | Den- ver | East St. Louis | Fort Worth | Kansas City | Omaha | South St. Joseph | South St. Paul | Sioux City | Total nine mar- kets ¹ | All other stock- yards report- ing ² | Total all stock yards report- ing ² |
|------|----------------|----------------|----------------------|----------------|----------------|----------------|------------------------|----------------------|----------------|--|--|---|
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| 1909 | 4,441 | 634 | 776 | 188 | 1,645 | 2,167 | 621 | 496 | 78 | 11,046 | ----- | ----- |
| 1910 | 5,220 | 596 | 736 | 163 | 1,841 | 2,985 | 560 | 865 | 151 | 13,126 | ----- | ----- |
| 1911 | 5,736 | 617 | 992 | 187 | 2,175 | 2,978 | 718 | 712 | 212 | 14,327 | ----- | ----- |
| 1912 | 6,056 | 777 | 1,031 | 284 | 2,134 | 2,951 | 729 | 628 | 207 | 14,797 | ----- | ----- |
| 1913 | 5,903 | 620 | 950 | 328 | 2,095 | 3,222 | 812 | 785 | 271 | 14,986 | ----- | ----- |
| 1914 | 5,378 | 692 | 749 | 408 | 2,002 | 3,114 | 830 | 795 | 404 | 14,372 | ----- | ----- |
| 1915 | 3,510 | 765 | 648 | 363 | 1,815 | 3,208 | 878 | 704 | 337 | 12,288 | 6,147 | 18,435 |
| 1916 | 4,291 | 1,409 | 671 | 431 | 1,758 | 3,171 | 804 | 623 | 321 | 13,479 | 7,213 | 20,692 |
| 1917 | 3,595 | 2,060 | 531 | 406 | 1,499 | 3,017 | 679 | 430 | 267 | 12,484 | 7,732 | 20,219 |
| 1918 | 4,630 | 1,652 | 536 | 335 | 1,667 | 3,386 | 827 | 630 | 387 | 14,050 | 8,435 | 22,485 |
| 1919 | 5,244 | 2,087 | 724 | 453 | 1,945 | 3,789 | 1,007 | 912 | 686 | 16,847 | 10,409 | 27,256 |
| 1920 | 4,005 | 2,079 | 605 | 394 | 1,687 | 2,891 | 843 | 729 | 358 | 13,591 | 9,947 | 23,538 |
| 1921 | 4,734 | 1,468 | 636 | 357 | 1,780 | 2,753 | 931 | 633 | 288 | 13,580 | 10,588 | 24,168 |
| 1922 | 3,874 | 1,867 | 628 | 325 | 1,574 | 2,533 | 730 | 499 | 223 | 12,253 | 10,111 | 22,364 |
| 1923 | 4,068 | 1,857 | 561 | 386 | 1,671 | 2,970 | 979 | 454 | 216 | 13,192 | 8,833 | 22,025 |
| 1924 | 4,192 | 2,040 | 489 | 373 | 1,599 | 2,844 | 1,089 | 476 | 310 | 13,382 | 8,819 | 22,201 |
| 1925 | 3,969 | 2,357 | 559 | 314 | 1,500 | 2,420 | 1,143 | 545 | 300 | 13,167 | 8,933 | 22,100 |
| 1926 | 4,405 | 1,826 | 636 | 445 | 1,762 | 2,780 | 1,303 | 772 | 449 | 14,379 | 9,489 | 23,868 |
| 1927 | 3,829 | 1,908 | 574 | 445 | 1,616 | 2,604 | 1,348 | 705 | 527 | 13,556 | 10,383 | 23,939 |
| 1928 | 3,898 | 2,295 | 510 | 458 | 1,767 | 3,037 | 1,580 | 891 | 568 | 14,974 | 10,623 | 25,597 |
| 1929 | 3,785 | 2,290 | 534 | 540 | 1,753 | 3,031 | 1,636 | 1,139 | 840 | 15,548 | 11,320 | 26,868 |

Bureau of Agricultural Economics. Prior to 1915 receipts compiled from yearbooks of stockyard companies; subsequent figures compiled from data of the livestock and meat reporting service of the bureau. Receipts, 1900-1908, are available in 1924 Yearbook, p. 935, Table 542.

¹ Total of the rounded detail figures.

² Figures prior to 1915 not obtainable.

TABLE 399.—*Sheep: Receipts and stocker and feeder shipments at all public stockyards, 1915-1929*

RECEIPTS

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| 1915 ¹ | 1,517 | 1,257 | 1,248 | 1,019 | 1,050 | 1,080 | 1,264 | 1,725 | 2,501 | 2,359 | 2,042 | 1,373 | 18,435 |
| 1916 ¹ | 1,450 | 1,280 | 1,156 | 1,144 | 1,347 | 1,394 | 1,451 | 1,984 | 2,650 | 3,231 | 2,126 | 1,479 | 20,692 |
| 1917 | 1,578 | 1,384 | 1,256 | 1,152 | 1,059 | 1,240 | 1,353 | 1,763 | 2,554 | 3,195 | 2,102 | 1,583 | 20,219 |
| 1918 | 1,354 | 1,096 | 1,270 | 1,150 | 1,214 | 1,429 | 1,639 | 2,270 | 3,496 | 3,327 | 2,605 | 1,626 | 22,485 |
| 1919 | 1,694 | 1,157 | 1,268 | 1,438 | 1,468 | 1,775 | 2,287 | 3,360 | 3,854 | 3,754 | 2,845 | 2,456 | 27,256 |
| 1920 | 1,614 | 1,416 | 1,315 | 1,466 | 1,488 | 1,640 | 2,034 | 2,606 | 2,895 | 3,027 | 2,471 | 1,566 | 23,538 |
| 1921 | 1,792 | 1,516 | 1,750 | 1,677 | 1,916 | 1,849 | 1,776 | 2,500 | 2,618 | 3,042 | 2,068 | 1,664 | 24,168 |
| 1922 | 1,835 | 1,399 | 1,465 | 1,227 | 1,692 | 1,700 | 1,677 | 1,951 | 2,303 | 3,311 | 2,288 | 1,516 | 22,364 |
| 1923 | 1,636 | 1,366 | 1,430 | 1,447 | 1,794 | 1,426 | 1,661 | 1,800 | 2,659 | 3,464 | 1,816 | 1,526 | 22,025 |
| 1924 | 1,697 | 1,412 | 1,367 | 1,348 | 1,844 | 1,550 | 1,072 | 2,005 | 3,027 | 3,295 | 1,879 | 1,605 | 22,201 |
| 1925 | 1,467 | 1,388 | 1,504 | 1,541 | 1,689 | 1,603 | 1,699 | 2,064 | 2,627 | 3,198 | 1,712 | 1,608 | 22,100 |
| 1926 | 1,548 | 1,486 | 1,694 | 1,502 | 1,717 | 1,913 | 1,739 | 2,277 | 3,279 | 3,090 | 1,917 | 1,706 | 23,868 |
| 1927 | 1,740 | 1,501 | 1,558 | 1,486 | 2,013 | 1,816 | 1,676 | 2,209 | 2,848 | 3,587 | 1,896 | 1,609 | 23,939 |
| 1928 | 1,705 | 1,669 | 1,520 | 1,591 | 1,952 | 1,913 | 1,898 | 2,362 | 3,396 | 3,938 | 2,053 | 1,610 | 25,597 |
| 1929 | 1,877 | 1,844 | 1,527 | 2,012 | 2,173 | 1,752 | 2,119 | 2,545 | 3,356 | 4,093 | 2,168 | 1,703 | 26,868 |

STOCKER AND FEEDER SHIPMENTS

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| 1916 ¹ | 73 | 77 | 62 | 58 | 87 | 83 | 100 | 340 | 661 | 1,065 | 546 | 145 | 3,277 |
| 1917 | 126 | 107 | 68 | 102 | 76 | 146 | 195 | 368 | 968 | 1,195 | 701 | 306 | 4,448 |
| 1918 | 128 | 122 | 124 | 221 | 101 | 242 | 212 | 525 | 1,105 | 1,245 | 763 | 360 | 5,208 |
| 1919 | 229 | 131 | 136 | 207 | 160 | 223 | 340 | 1,039 | 1,505 | 1,388 | 860 | 740 | 6,956 |
| 1920 | 311 | 140 | 135 | 269 | 234 | 227 | 325 | 568 | 796 | 1,059 | 857 | 259 | 5,180 |
| 1921 | 88 | 62 | 84 | 107 | 123 | 89 | 139 | 404 | 555 | 731 | 511 | 202 | 3,095 |
| 1922 | 183 | 169 | 143 | 97 | 145 | 191 | 204 | 350 | 534 | 1,138 | 757 | 256 | 4,167 |
| 1923 | 171 | 169 | 114 | 82 | 216 | 117 | 188 | 341 | 897 | 1,489 | 540 | 154 | 4,478 |
| 1924 | 149 | 106 | 83 | 105 | 118 | 152 | 226 | 444 | 973 | 1,438 | 676 | 206 | 4,676 |
| 1925 | 138 | 119 | 94 | 109 | 178 | 137 | 193 | 421 | 857 | 1,392 | 475 | 219 | 4,332 |
| 1926 | 155 | 107 | 83 | 124 | 130 | 238 | 260 | 567 | 1,093 | 1,150 | 493 | 223 | 4,623 |
| 1927 | 207 | 136 | 140 | 118 | 259 | 258 | 216 | 390 | 947 | 1,580 | 497 | 174 | 4,902 |
| 1928 | 116 | 101 | 96 | 134 | 205 | 278 | 234 | 564 | 1,080 | 1,466 | 544 | 193 | 5,011 |
| 1929 | 188 | 115 | 122 | 210 | 218 | 226 | 231 | 639 | 1,027 | 1,831 | 575 | 183 | 5,565 |

Bureau of Agricultural Economics. Compiled from data of livestock and meat reporting service of bureau.

¹ Complete information for 1915 and 1916, particularly on disposition of stock, is not obtainable.

NOTE.—A table similar to Table 403, 1928 Yearbook, receipts, local slaughter, and stocker and feeder shipments of sheep, is omitted.

TABLE 400.—Feeder sheep, inspected: Shipments from public stockyards, by months, 1929

| Origin and destination | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---------------------------|----------------|---------------|---------------|---------------|----------------|---------------|----------------|----------------|----------------|------------------|----------------|----------------|------------------|
| Market origin: | | | | | | | | | | | | | |
| Chicago, Ill. | 20,394 | 15,058 | 9,338 | 6,408 | 12,724 | 12,315 | 20,474 | 76,633 | 131,512 | 137,556 | 62,062 | 21,187 | 531,564 |
| Denver, Colo. | 43,699 | 14,026 | 9,677 | 6,019 | 9,386 | 7,075 | 2,635 | 4,436 | 87,402 | 687,832 | 186,067 | 32,187 | 1,063,461 |
| East St. Louis, Ill. | 3,843 | 5,444 | 428 | 1 | 2,049 | 2,558 | 1,935 | 2,555 | 3,721 | 16,268 | 345 | 16,842 | 372 |
| Fort Worth, Tex. | 3,843 | 6,442 | 6,498 | 11,255 | 10,500 | 6,941 | 6,000 | 6,941 | 6,974 | 8,073 | 8,073 | 2,969 | 90,758 |
| Kansas City, Kans. | 10,869 | 6,100 | 9,143 | 10,393 | 8,332 | 4,277 | 10,182 | 23,874 | 34,053 | 43,230 | 11,937 | 9,038 | 184,081 |
| Louisville, Ky. | | | | 202 | | | | 5,660 | 3,707 | 689 | 94 | | 16,718 |
| Ogden, Utah | 5,343 | 2,491 | 382 | 3,332 | 10,398 | 2,101 | 2,582 | 5,660 | 21,483 | 43,182 | 13,682 | 5,267 | 121,315 |
| Omaha, Nebr. | 26,403 | 17,201 | 26,447 | 29,144 | 33,481 | 31,881 | 70,979 | 108,066 | 265,224 | 160,283 | 53,716 | 30,223 | 972,997 |
| Sioux City, Iowa | 8,229 | 4,812 | 3,121 | 2,784 | 1,508 | 2,282 | 10,447 | 31,953 | 53,357 | 24,649 | 14,431 | 14,431 | 215,459 |
| South St. Joseph, Mo. | 9,252 | 5,458 | 947 | 2,856 | 5,495 | 2,778 | 5,731 | 26,530 | 42,539 | 26,605 | 8,071 | 5,488 | 141,750 |
| South St. Paul, Minn. | 5,575 | 3,482 | 2,746 | 1,679 | 790 | | | 8,071 | 14,632 | 40,638 | 23,100 | 8,339 | 109,661 |
| All other inspected | 5,574 | 6,242 | 7,012 | 2,885 | 10,210 | 6,045 | 9,243 | 15,667 | 30,807 | 66,415 | 17,794 | 3,339 | 180,734 |
| Total | 139,535 | 80,856 | 75,739 | 77,302 | 105,063 | 78,769 | 146,002 | 413,087 | 695,111 | 1,308,525 | 411,538 | 133,713 | 3,665,260 |
| State destination: | | | | | | | | | | | | | |
| Colorado | 26,288 | 8,322 | 3,224 | 6,067 | 12,066 | 8,706 | 3,720 | 5,245 | 67,810 | 580,427 | 130,125 | 21,494 | 874,503 |
| Illinois | 5,332 | 4,088 | 2,918 | 1,321 | 7,327 | 3,633 | 14,262 | 53,779 | 70,068 | 44,245 | 10,932 | 11,573 | 229,438 |
| Indiana | 3,188 | 2,134 | 1,408 | 1,083 | 1,592 | 9,930 | 13,372 | 40,044 | 41,475 | 31,665 | 8,856 | 5,960 | 161,507 |
| Iowa | 8,229 | 6,437 | 3,806 | 5,610 | 3,424 | 12,837 | 44,834 | 130,598 | 113,475 | 99,119 | 33,409 | 17,083 | 612,761 |
| Kansas | 11,869 | 8,709 | 6,599 | 5,193 | 8,123 | 2,761 | 5,148 | 21,904 | 53,653 | 65,303 | 21,225 | 9,615 | 219,945 |
| Kentucky | 7,784 | 6,422 | 4,346 | 2,116 | 3,566 | 2,268 | 2,587 | 10,329 | 3,899 | 1,371 | 11,133 | | 30,140 |
| Michigan | 7,823 | 1,313 | 1,890 | | | 2,482 | | 6,207 | 27,428 | 48,716 | 28,963 | 11,133 | 149,048 |
| Minnesota | 3,301 | 3,486 | 1,690 | 5,741 | 7,803 | 5,066 | 7,104 | 6,207 | 9,550 | 13,240 | 10,687 | 2,438 | 45,940 |
| Missouri | 53,090 | 27,960 | 38,272 | 35,180 | 32,863 | 20,968 | 34,873 | 20,063 | 27,135 | 26,578 | 13,511 | 5,380 | 138,454 |
| Nebraska | 6,090 | 886 | 357 | 130 | 238 | 737 | 944 | 90,005 | 151,525 | 804,191 | 102,734 | 31,652 | 948,994 |
| Ohio | 2,733 | 3,134 | 384 | 4,381 | 2,359 | 234 | | 6,433 | 12,033 | 21,115 | 4,076 | 1,745 | 49,572 |
| South Dakota | 6,314 | 2,189 | 2,189 | 4,361 | 2,399 | 3,896 | 2,423 | 5,200 | 13,363 | 17,864 | 6,480 | 2,646 | 52,594 |
| Texas | 6,858 | 4,991 | 3,512 | 4,801 | 5,401 | 3,896 | | 2,786 | 3,086 | 6,635 | 6,235 | 2,636 | 30,260 |
| Wisconsin | 6,858 | 4,991 | 3,512 | 4,801 | 5,401 | 3,896 | 2,423 | 5,200 | 13,363 | 17,864 | 6,480 | 2,646 | 52,594 |
| All other | 3,817 | 5,074 | 6,807 | 6,068 | 12,663 | 5,897 | 8,738 | 9,513 | 21,401 | 16,489 | 26,031 | 7,496 | 136,162 |
| Total | 139,535 | 80,856 | 75,739 | 77,302 | 105,063 | 78,769 | 146,002 | 413,087 | 695,111 | 1,308,525 | 411,538 | 133,713 | 3,665,260 |

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

TABLE 401.—Feeder sheep, inspected: Shipments from public stockyards, 1920-1928

| Origin and destination | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|---------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Thou-</i> | <i>sands</i> | <i>Thou-</i> | <i>sands</i> | <i>Thou-</i> | <i>sands</i> | <i>Thou-</i> | <i>sands</i> | <i>Thou-</i> |
| Market origin: | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> | <i>sands</i> |
| Chicago, Ill. | 829 | 530 | 709 | 683 | 730 | 590 | 784 | 517 | 441 |
| Denver, Colo. | 1,139 | 576 | 954 | 1,002 | 1,092 | 1,022 | 764 | 1,133 | 1,004 |
| East St. Louis, Ill. | 36 | 13 | 21 | 18 | 18 | 27 | 43 | 20 | 13 |
| Fort Worth, Tex. | 59 | 41 | 65 | 39 | 61 | 62 | 87 | 63 | 106 |
| Kansas City, Kans. | 338 | 251 | 243 | 281 | 280 | 215 | 282 | 283 | 280 |
| Louisville, Ky. | 20 | 25 | 42 | 34 | 18 | 27 | 61 | 51 | 42 |
| Omaha, Nebr. | 1,157 | 722 | 768 | 863 | 867 | 611 | 894 | 885 | 882 |
| Sioux City, Iowa | 73 | 50 | 35 | 48 | 59 | 57 | 79 | 96 | 98 |
| South St. Joseph, Mo. | 63 | 39 | 32 | 61 | 103 | 52 | 78 | 106 | 130 |
| South St. Paul, Minn. | 87 | 66 | 46 | 73 | 52 | 49 | 62 | 57 | 69 |
| All other inspected | 132 | 67 | 96 | 75 | 75 | 72 | 120 | 130 | 331 |
| Total | 3,933 | 2,380 | 3,011 | 3,177 | 3,355 | 2,784 | 3,254 | 3,341 | 3,396 |
| State destination: | | | | | | | | | |
| Colorado | 728 | 325 | 679 | 727 | 715 | 610 | 358 | 722 | 730 |
| Illinois | 338 | 198 | 227 | 256 | 280 | 248 | 320 | 193 | 216 |
| Indiana | 125 | 135 | 104 | 150 | 166 | 186 | 270 | 162 | 104 |
| Iowa | 615 | 292 | 282 | 405 | 403 | 302 | 476 | 381 | 457 |
| Kansas | 182 | 93 | 141 | 120 | 183 | 179 | 189 | 234 | 256 |
| Kentucky | 32 | 32 | 56 | 39 | 23 | 33 | 63 | 58 | 44 |
| Michigan | 280 | 189 | 359 | 314 | 341 | 266 | 342 | 203 | 172 |
| Minnesota | 45 | 43 | 22 | 32 | 28 | 33 | 40 | 34 | 24 |
| Missouri | 237 | 181 | 172 | 190 | 198 | 138 | 172 | 177 | 171 |
| Nebraska | 734 | 639 | 692 | 736 | 780 | 608 | 705 | 909 | 864 |
| Ohio | 104 | 83 | 81 | 52 | 32 | 26 | 85 | 33 | 22 |
| South Dakota | 26 | 11 | 10 | 14 | 11 | 11 | 22 | 43 | 43 |
| Texas | 81 | 22 | 35 | 16 | 31 | 25 | 61 | 41 | 64 |
| Wisconsin | 83 | 43 | 31 | 40 | 55 | 41 | 50 | 34 | 58 |
| All other | 323 | 94 | 120 | 86 | 106 | 78 | 101 | 117 | 171 |
| Total | 3,933 | 2,380 | 3,011 | 3,177 | 3,355 | 2,784 | 3,254 | 3,341 | 3,396 |

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

1 Includes 41 head shipped to Alaska.

TABLE 402.—Farm prices of sheep, per head, by ages, United States, January 1, 1912-1930

| Jan. 1— | Under 1 year old | Ewes 1 year and over | Wethers 1 year and over | Rams | Jan. 1— | Under 1 year old | Ewes 1 year and over | Wethers 1 year and over | Rams |
|---------|------------------|----------------------|-------------------------|----------------|---------|------------------|----------------------|-------------------------|----------------|
| | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| 1912 | 2.64 | 3.45 | 3.43 | 8.26 | 1922 | 4.25 | 4.83 | 4.05 | 11.31 |
| 1913 | 3.11 | 3.98 | 3.93 | 8.80 | 1923 | 6.80 | 7.67 | 5.90 | 14.30 |
| 1914 | 3.22 | 4.09 | 4.06 | 8.49 | 1924 | 6.97 | 8.10 | 5.98 | 15.55 |
| 1915 | 3.62 | 4.59 | 4.48 | 9.01 | 1925 | 8.53 | 10.02 | 7.13 | 16.91 |
| 1916 | 4.13 | 5.35 | 5.02 | 10.32 | 1926 | 9.04 | 11.01 | 7.32 | 18.45 |
| 1917 | 5.63 | 7.48 | 6.78 | 13.62 | 1927 | 7.91 | 10.32 | 6.60 | 18.73 |
| 1918 | 9.06 | 12.70 | 11.26 | 20.84 | 1928 | 8.44 | 10.85 | 7.36 | 19.61 |
| 1919 | 8.82 | 12.44 | 11.02 | 21.90 | 1929 | 8.83 | 11.19 | 7.66 | 20.30 |
| 1920 | 8.07 | 11.04 | 9.64 | 21.94 | 1930 | 7.85 | 9.13 | 6.41 | 19.43 |
| 1921 | 5.33 | 6.38 | 5.94 | 15.13 | | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Average price, by States, weighted by estimated numbers each age group.

TABLE 403.—*Sheep: Estimated price per 100 pounds received by producers, United States, 1910-1929*

| Year | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Weighted average |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1910..... | 5.63 | 5.09 | 5.64 | 6.10 | 5.79 | 5.44 | 5.47 | 4.68 | 4.81 | 4.68 | 4.63 | 4.54 | 5.24 |
| 1911..... | 4.47 | 4.34 | 4.45 | 4.55 | 4.51 | 4.24 | 4.19 | 3.98 | 3.91 | 3.68 | 3.65 | 3.71 | 4.16 |
| 1912..... | 3.89 | 4.01 | 4.12 | 4.57 | 4.74 | 4.52 | 4.21 | 4.26 | 4.11 | 4.19 | 4.05 | 4.21 | 4.24 |
| 1913..... | 4.35 | 4.63 | 4.97 | 5.16 | 4.91 | 4.84 | 4.20 | 4.32 | 4.23 | 4.16 | 4.27 | 4.46 | 4.55 |
| 1914..... | 4.67 | 4.67 | 4.77 | 4.96 | 4.87 | 4.70 | 4.75 | 4.87 | 4.80 | 4.81 | 4.68 | 4.95 | 4.79 |
| 1915..... | 4.95 | 5.14 | 5.36 | 5.60 | 5.54 | 5.43 | 5.35 | 5.16 | 5.06 | 5.18 | 5.18 | 5.38 | 5.27 |
| 1916..... | 5.52 | 5.90 | 6.35 | 6.61 | 6.06 | 6.54 | 6.33 | 6.22 | 6.25 | 6.20 | 6.41 | 6.77 | 6.29 |
| 1917..... | 7.33 | 8.17 | 9.21 | 9.69 | 10.15 | 9.84 | 9.32 | 9.33 | 10.05 | 10.24 | 10.20 | 10.46 | 9.45 |
| 1918..... | 10.55 | 10.75 | 11.41 | 11.98 | 12.32 | 11.56 | 11.04 | 10.99 | 10.79 | 10.35 | 10.11 | 9.44 | 10.95 |
| 1919..... | 9.68 | 9.95 | 10.45 | 11.33 | 10.93 | 10.34 | 9.25 | 9.06 | 8.69 | 8.46 | 8.35 | 8.53 | 9.63 |
| 1920..... | 9.34 | 9.97 | 10.25 | 10.66 | 10.34 | 9.13 | 8.21 | 7.54 | 7.24 | 6.62 | 6.20 | 5.54 | 8.51 |
| 1921..... | 5.30 | 5.01 | 5.27 | 5.11 | 5.11 | 4.74 | 4.34 | 4.38 | 4.11 | 3.96 | 3.84 | 4.10 | 4.65 |
| 1922..... | 4.57 | 5.71 | 6.51 | 6.43 | 6.65 | 6.09 | 6.11 | 5.98 | 5.70 | 5.93 | 6.02 | 6.27 | 5.96 |
| 1923..... | 6.88 | 6.83 | 7.06 | 7.20 | 6.92 | 6.43 | 6.43 | 6.22 | 6.57 | 6.33 | 6.20 | 6.39 | 6.65 |
| 1924..... | 6.71 | 6.82 | 7.22 | 7.45 | 7.33 | 7.09 | 6.60 | 6.32 | 6.30 | 6.32 | 6.39 | 6.84 | 6.81 |
| 1925..... | 7.86 | 8.41 | 8.20 | 8.42 | 7.53 | 7.04 | 7.17 | 7.32 | 7.27 | 7.31 | 7.51 | 7.70 | 7.70 |
| 1926..... | 7.95 | 8.20 | 7.66 | 7.67 | 7.78 | 7.56 | 7.09 | 6.92 | 7.13 | 6.93 | 6.75 | 6.96 | 7.43 |
| 1927..... | 6.87 | 7.16 | 7.41 | 7.40 | 7.68 | 7.27 | 7.16 | 7.13 | 7.06 | 7.05 | 7.42 | 7.38 | 7.26 |
| 1928..... | 7.52 | 7.60 | 7.85 | 8.11 | 8.09 | 7.84 | 7.56 | 7.53 | 7.58 | 7.50 | 7.50 | 7.29 | 7.68 |
| 1929..... | 7.84 | 7.98 | 8.36 | 8.40 | 8.09 | 7.86 | 7.25 | 7.32 | 7.01 | 6.83 | 6.75 | 6.61 | 7.55 |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by number of sheep Jan. 1, by States; yearly price obtained by weighting monthly prices by Federal inspected slaughter.

TABLE 404.—*Lambs: Estimated price per 100 pounds received by producers, United States, 1910-1929*

| Year beginning June | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | Weighted average |
|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1910..... | 7.13 | 6.71 | 5.70 | 5.85 | 5.78 | 5.54 | 5.60 | 5.71 | 5.44 | 5.49 | 5.77 | 5.74 | 5.79 |
| 1911..... | 5.51 | 5.42 | 5.25 | 5.02 | 4.68 | 4.68 | 4.93 | 5.22 | 5.15 | 5.38 | 5.98 | 6.16 | 5.28 |
| 1912..... | 6.02 | 5.74 | 5.60 | 5.49 | 5.42 | 5.37 | 5.70 | 6.03 | 6.34 | 6.56 | 6.59 | 6.66 | 5.96 |
| 1913..... | 6.36 | 6.05 | 5.50 | 5.51 | 5.51 | 5.64 | 5.85 | 6.16 | 6.18 | 6.31 | 6.47 | 6.49 | 6.03 |
| 1914..... | 6.47 | 6.55 | 6.26 | 6.27 | 6.09 | 6.14 | 6.33 | 6.47 | 6.67 | 6.06 | 7.35 | 7.32 | 6.49 |
| 1915..... | 7.26 | 7.21 | 6.70 | 6.71 | 6.70 | 6.76 | 7.02 | 7.29 | 7.78 | 8.10 | 8.58 | 8.49 | 7.38 |
| 1916..... | 8.36 | 8.16 | 8.15 | 8.22 | 8.02 | 8.41 | 8.72 | 9.59 | 10.51 | 11.46 | 12.03 | 12.51 | 9.50 |
| 1917..... | 12.64 | 11.19 | 12.08 | 13.06 | 14.09 | 13.79 | 13.81 | 13.83 | 13.77 | 14.11 | 15.34 | 15.39 | 13.60 |
| 1918..... | 14.98 | 14.20 | 14.20 | 13.73 | 13.20 | 12.54 | 12.44 | 12.71 | 13.17 | 14.03 | 14.61 | 14.34 | 13.65 |
| 1919..... | 13.89 | 13.09 | 12.91 | 12.25 | 11.47 | 11.45 | 11.85 | 12.91 | 14.08 | 14.17 | 14.63 | 14.26 | 13.06 |
| 1920..... | 12.82 | 11.79 | 10.84 | 10.31 | 9.65 | 9.37 | 8.46 | 8.44 | 7.76 | 7.90 | 7.55 | 7.78 | 9.41 |
| 1921..... | 7.59 | 7.37 | 6.99 | 6.27 | 5.98 | 6.12 | 6.60 | 7.33 | 8.87 | 10.21 | 10.54 | 10.39 | 7.83 |
| 1922..... | 9.87 | 9.55 | 9.39 | 9.43 | 10.06 | 10.30 | 10.49 | 10.69 | 10.83 | 11.01 | 10.69 | 11.00 | 10.30 |
| 1923..... | 10.72 | 10.60 | 9.96 | 10.28 | 10.17 | 10.01 | 10.10 | 10.19 | 10.53 | 11.22 | 11.32 | 11.43 | 10.54 |
| 1924..... | 11.21 | 10.50 | 10.15 | 10.18 | 10.35 | 10.55 | 10.96 | 12.69 | 13.13 | 13.48 | 12.22 | 11.99 | 11.45 |
| 1925..... | 11.62 | 11.71 | 11.80 | 11.95 | 12.04 | 12.20 | 12.67 | 12.79 | 12.02 | 11.56 | 11.32 | 11.78 | 11.98 |
| 1926..... | 12.07 | 11.52 | 11.12 | 11.32 | 11.31 | 11.11 | 10.92 | 10.65 | 10.84 | 11.55 | 11.97 | 11.92 | 11.36 |
| 1927..... | 11.95 | 11.44 | 11.15 | 11.14 | 11.22 | 11.42 | 11.39 | 11.34 | 11.90 | 12.31 | 12.73 | 13.03 | 11.76 |
| 1928..... | 13.18 | 12.25 | 11.88 | 11.97 | 11.57 | 11.50 | 11.41 | 12.23 | 12.60 | 13.12 | 13.36 | 12.79 | 12.31 |
| 1929..... | 12.31 | 11.90 | 11.46 | 11.08 | 10.97 | 10.74 | 10.76 | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by number of lambs Jan. 1, by States; yearly price obtained by weighting monthly prices by receipts at principal markets.

TABLE 405.—*Sheep and lambs: Average price per 100 pounds at Chicago, by months, 1905-1929*

SHEEP

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average ¹ |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1905 | 5.15 | 5.55 | 5.50 | 5.08 | 4.75 | 4.72 | 5.10 | 4.95 | 4.72 | 5.10 | 5.10 | 5.25 | 5.08 |
| 1906 | 5.40 | 5.12 | 5.28 | 5.35 | 5.55 | 5.45 | 5.25 | 4.98 | 5.15 | 4.90 | 5.05 | 5.08 | 5.21 |
| 1907 | 5.15 | 5.20 | 5.50 | 5.65 | 5.78 | 5.90 | 5.32 | 5.32 | 5.18 | 4.82 | 4.38 | 4.18 | 5.20 |
| 1908 | 4.80 | 5.10 | 5.90 | 5.70 | 5.40 | 4.65 | 4.05 | 3.80 | 3.75 | 4.05 | 4.20 | 4.30 | 4.64 |
| 1909 | 4.90 | 5.00 | 5.25 | 5.65 | 6.15 | 5.30 | 4.70 | 4.00 | 4.65 | 4.30 | 4.55 | 4.85 | 4.99 |
| 1910 | 5.55 | 6.50 | 7.60 | 7.60 | 6.55 | 5.10 | 4.20 | 4.20 | 4.25 | 3.95 | 3.70 | 3.90 | 5.26 |
| 1911 | 4.10 | 4.15 | 4.70 | 4.20 | 4.45 | 3.80 | 3.95 | 3.50 | 3.80 | 3.65 | 3.45 | 3.55 | 3.94 |
| 1912 | 4.30 | 4.15 | 5.30 | 5.90 | 6.15 | 4.50 | 4.25 | 4.05 | 4.15 | 4.00 | 4.05 | 4.45 | 4.60 |
| 1913 | 5.35 | 5.90 | 6.40 | 6.45 | 5.85 | 5.05 | 4.50 | 4.35 | 4.30 | 4.55 | 4.60 | 4.95 | 5.19 |
| 1914 | 5.50 | 5.70 | 5.95 | 6.25 | 5.65 | 5.10 | 5.40 | 5.55 | 5.30 | 5.20 | 5.65 | 5.40 | 5.56 |
| 1915 | 5.80 | 6.45 | 7.45 | 7.70 | 7.35 | 5.50 | 6.05 | 6.25 | 5.75 | 6.00 | 5.85 | 6.20 | 6.36 |
| 1916 | 7.20 | 7.75 | 8.25 | 8.15 | 8.20 | 7.35 | 7.25 | 7.35 | 7.80 | 7.50 | 8.00 | 9.00 | 7.82 |
| 1917 | 10.00 | 11.25 | 11.70 | 12.10 | 13.00 | 10.00 | 9.10 | 9.75 | 11.15 | 11.65 | 11.25 | 11.50 | 11.04 |
| 1918 | 12.20 | 12.35 | 13.00 | 15.65 | 14.75 | 13.40 | 12.65 | 13.15 | 11.80 | 10.45 | 9.85 | 9.40 | 12.44 |
| 1919 | 10.35 | 11.35 | 14.05 | 14.90 | 12.25 | 9.30 | 9.70 | 9.75 | 8.30 | 8.15 | 8.30 | 9.60 | 10.47 |
| 1920 | 11.80 | 13.35 | 13.40 | 14.25 | 12.25 | 8.50 | 8.90 | 7.70 | 6.85 | 6.45 | 5.75 | 4.70 | 9.49 |
| 1921 | 5.07 | 4.90 | 6.14 | 6.58 | 6.33 | 4.46 | 5.08 | 4.53 | 4.49 | 4.71 | 4.40 | 4.92 | 5.13 |
| 1922 | 7.26 | 8.28 | 9.17 | 9.33 | 7.35 | 5.59 | 6.12 | 5.63 | 6.05 | 6.25 | 7.48 | 7.28 | 7.15 |
| 1923 | 7.72 | 8.08 | 8.64 | 8.90 | 6.74 | 5.00 | 5.16 | 7.09 | 7.25 | 6.35 | 6.89 | 7.37 | 7.10 |
| 1924 | 8.16 | 9.12 | 10.50 | 10.21 | 8.11 | 5.82 | 5.66 | 6.18 | 5.46 | 6.60 | 6.62 | 8.45 | 8.57 |
| 1925 | 10.33 | 9.69 | 9.22 | 7.84 | 7.96 | 6.25 | 7.48 | 6.83 | 6.95 | 7.64 | 8.16 | 9.57 | 8.16 |
| 1926 | 9.72 | 9.18 | 8.82 | 8.87 | 7.97 | 5.85 | 5.97 | 6.50 | 6.25 | 6.12 | 5.88 | 5.86 | 7.25 |
| 1927 | 6.94 | 8.03 | 8.88 | 9.62 | 7.44 | 5.88 | 6.25 | 6.47 | 6.14 | 6.00 | 6.40 | 6.41 | 7.04 |
| 1928 | 7.03 | 8.96 | 9.47 | 10.16 | 8.53 | 6.12 | 6.28 | 6.72 | 6.34 | 6.18 | 5.84 | 7.03 | 7.39 |
| 1929 | 9.32 | 8.78 | 9.72 | 10.34 | 6.77 | 6.28 | 5.85 | 5.34 | 4.56 | 4.70 | 5.38 | 5.41 | 6.87 |

LAMBS

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average ¹ |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1905 | 7.15 | 7.40 | 7.05 | 6.80 | 6.25 | 5.90 | 6.30 | 7.05 | 7.00 | 7.05 | 6.90 | 7.25 | 6.84 |
| 1906 | 7.25 | 6.75 | 6.40 | 6.20 | 6.65 | 6.75 | 6.90 | 7.00 | 7.15 | 6.95 | 6.90 | 7.10 | 6.83 |
| 1907 | 7.30 | 7.30 | 7.55 | 8.05 | 7.80 | 7.20 | 7.05 | 6.90 | 6.90 | 6.80 | 6.05 | 5.70 | 7.05 |
| 1908 | 6.80 | 6.70 | 7.20 | 7.25 | 6.65 | 5.75 | 6.20 | 6.05 | 5.35 | 5.50 | 5.85 | 6.70 | 6.33 |
| 1909 | 7.35 | 7.50 | 7.65 | 7.85 | 8.25 | 7.60 | 7.70 | 7.35 | 6.80 | 6.50 | 7.10 | 7.50 | 7.43 |
| 1910 | 8.30 | 8.65 | 9.40 | 9.10 | 8.40 | 7.60 | 7.10 | 6.70 | 6.80 | 6.65 | 6.25 | 6.10 | 7.59 |
| 1911 | 6.20 | 6.05 | 6.10 | 5.50 | 5.85 | 6.10 | 6.30 | 6.35 | 5.70 | 5.75 | 5.45 | 5.75 | 5.92 |
| 1912 | 6.50 | 6.15 | 7.30 | 7.95 | 8.30 | 6.90 | 7.25 | 7.10 | 7.00 | 6.75 | 7.15 | 7.75 | 7.18 |
| 1913 | 8.55 | 8.50 | 8.60 | 8.40 | 7.40 | 6.85 | 7.55 | 7.40 | 7.15 | 7.05 | 7.25 | 7.60 | 7.69 |
| 1914 | 7.90 | 7.60 | 7.65 | 7.60 | 8.10 | 7.95 | 8.45 | 8.15 | 7.80 | 7.60 | 8.75 | 8.30 | 7.99 |
| 1915 | 8.40 | 8.75 | 9.55 | 9.65 | 10.10 | 9.20 | 8.75 | 8.90 | 8.75 | 8.75 | 8.80 | 9.00 | 9.05 |
| 1916 | 10.30 | 10.90 | 11.10 | 10.45 | 10.75 | 9.55 | 10.55 | 10.75 | 10.60 | 10.15 | 11.40 | 12.70 | 10.77 |
| 1917 | 13.85 | 14.30 | 14.25 | 14.40 | 16.90 | 15.25 | 15.65 | 15.50 | 17.50 | 17.40 | 16.75 | 16.45 | 15.68 |
| 1918 | 17.20 | 16.60 | 17.55 | 19.20 | 18.00 | 16.85 | 18.50 | 17.50 | 17.25 | 15.35 | 15.10 | 14.60 | 16.98 |
| 1919 | 16.25 | 17.40 | 19.05 | 18.15 | 16.25 | 14.05 | 17.10 | 16.75 | 14.85 | 15.00 | 14.50 | 16.40 | 16.31 |
| 1920 | 19.50 | 19.95 | 18.80 | 18.80 | 17.40 | 14.25 | 15.55 | 13.20 | 13.30 | 12.35 | 11.70 | 11.20 | 15.50 |
| 1921 | 10.72 | 9.07 | 9.91 | 9.69 | 11.07 | 10.67 | 10.09 | 9.46 | 8.86 | 8.66 | 9.25 | 10.66 | 9.86 |
| 1922 | 12.67 | 14.49 | 15.39 | 14.10 | 12.95 | 12.42 | 13.04 | 12.51 | 13.53 | 13.94 | 14.17 | 14.93 | 13.68 |
| 1923 | 14.69 | 14.85 | 14.56 | 14.42 | 14.12 | 14.81 | 14.22 | 12.80 | 13.52 | 12.93 | 12.75 | 12.96 | 13.89 |
| 1924 | 13.53 | 14.95 | 16.06 | 16.22 | 15.23 | 14.12 | 13.79 | 13.57 | 13.38 | 13.52 | 14.03 | 16.47 | 14.57 |
| 1925 | 18.28 | 17.59 | 16.28 | 14.85 | 13.06 | 15.86 | 15.11 | 14.88 | 15.19 | 15.20 | 15.44 | 16.15 | 15.66 |
| 1926 | 15.28 | 13.78 | 13.48 | 14.38 | 15.30 | 16.66 | 14.31 | 14.20 | 14.05 | 13.88 | 13.25 | 12.57 | 14.26 |
| 1927 | 12.64 | 13.28 | 15.27 | 15.87 | 14.75 | 15.66 | 14.25 | 13.68 | 13.46 | 13.70 | 13.80 | 13.14 | 14.12 |
| 1928 | 13.16 | 15.39 | 16.26 | 16.81 | 16.10 | 16.84 | 15.61 | 14.72 | 14.29 | 13.12 | 13.31 | 14.31 | 14.99 |
| 1929 | 16.37 | 16.53 | 17.07 | 16.82 | 13.62 | 15.35 | 14.38 | 13.50 | 13.19 | 12.72 | 12.72 | 13.22 | 14.62 |

Bureau of Agricultural Economics. Figures prior to 1921 for sheep and lambs, compiled from Chicago Drovers Journal Yearbook; subsequent figures are bulk of sales prices from data of the livestock and meat reporting service of the bureau. See 1927 Yearbook, p. 1031, for prices of lambs, 1901-1904.

¹ Simple average of monthly prices.

TABLE 406.—*Sheep and lambs: Average price per 100 pounds at Chicago and Omaha, by months, July, 1927, to December, 1929*

| Year and month | Chicago | | | | | | | | Omaha | | | | | | | |
|----------------|---------------------------------|------------------------------|--|-----------------------------------|-----------------|-----------------|--------------|---------------------------------|------------------------------|---|-----------------------------------|-----------------|-----------------|--------------|--|--|
| | Lambs | | Yearling wethers, 110 pounds down medium to choice | Ewes | | Feeder lambs | | Lambs | | Yearling wethers, 110 pounds down, medium to choice | Ewes | | Feeder lambs | | | |
| | 84 pounds down, good and choice | All weights, cull and common | | 120 pounds down, medium to choice | Cull and common | Good and choice | Medium | 84 pounds down, good and choice | All weights, cull and common | | 120 pounds down, medium to choice | Cull and common | Good and choice | Medium | | |
| | | | | | | | | | | | | | | | | |
| 1927 | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | <i>Doll.</i> | | |
| July | 14.18 | 10.79 | 10.83 | 5.97 | 3.25 | 12.94 | 11.85 | 13.66 | 10.17 | 10.18 | 5.73 | 3.16 | 12.83 | 11.87 | | |
| August | 13.49 | 10.27 | 10.42 | 5.90 | 3.12 | 13.02 | 11.90 | 13.07 | 9.91 | 9.59 | 5.75 | 3.16 | 13.13 | 12.15 | | |
| September | 13.38 | 10.46 | 10.25 | 5.06 | 2.56 | 13.40 | 12.38 | 12.94 | 9.96 | 9.09 | 5.36 | 2.88 | 13.16 | 12.06 | | |
| October | 13.68 | 11.01 | 10.98 | 5.60 | 3.04 | 14.04 | 13.26 | 13.09 | 10.34 | 9.25 | 5.38 | 3.00 | 13.31 | 12.22 | | |
| November | 13.88 | 11.34 | 11.16 | 5.93 | 3.35 | 14.03 | 13.30 | 13.27 | 10.92 | 9.50 | 5.52 | 3.05 | 13.15 | 12.45 | | |
| December | 13.38 | 10.68 | 10.49 | 6.04 | 3.40 | 13.35 | 12.56 | 12.81 | 10.15 | 9.45 | 5.88 | 3.15 | 12.46 | 11.74 | | |
| Av. 6 months | 13.66 | 10.76 | 10.69 | 5.75 | 3.12 | 13.46 | 12.54 | 13.14 | 10.24 | 9.52 | 5.60 | 3.07 | 13.06 | 12.08 | | |
| 1928 | | | | | | | | | | | | | | | | |
| January | 13.35 | 10.81 | 10.78 | 6.49 | 3.74 | 12.88 | 12.04 | 12.85 | 10.22 | 9.24 | 6.28 | 3.47 | 12.45 | 11.58 | | |
| February | 15.39 | 12.88 | 13.23 | 8.43 | 5.17 | 14.69 | 13.94 | 14.93 | 12.18 | 11.56 | 7.81 | 4.65 | 14.21 | 12.89 | | |
| March | 16.36 | 13.88 | 14.32 | 8.87 | 5.46 | 15.45 | 14.47 | 15.80 | 13.36 | 12.28 | 8.60 | 5.21 | 15.02 | 13.70 | | |
| April | 16.78 | 14.04 | 14.21 | 9.78 | 6.06 | 16.01 | 14.88 | 16.20 | 13.76 | 12.90 | 8.80 | 5.26 | 15.38 | 14.12 | | |
| May | 16.19 | 12.87 | 13.42 | 8.26 | 4.72 | ----- | ----- | 15.49 | 13.02 | 12.71 | 7.70 | 4.16 | ----- | ----- | | |
| June | 16.65 | 13.01 | 12.40 | 6.62 | 3.74 | ----- | ----- | 15.88 | 12.71 | 12.63 | 5.76 | 3.03 | 12.92 | 12.00 | | |
| July | 15.39 | 11.86 | 11.27 | 6.21 | 3.54 | 13.37 | 12.74 | 14.67 | 11.35 | 10.70 | 5.75 | 3.25 | 13.09 | 12.24 | | |
| August | 14.50 | 10.48 | 10.68 | 6.43 | 3.58 | 13.78 | 13.19 | 13.94 | 10.43 | 10.35 | 6.15 | 3.45 | 13.47 | 12.70 | | |
| September | 14.12 | 10.08 | 10.26 | 6.06 | 3.44 | 14.03 | 13.20 | 13.73 | 10.01 | 9.78 | 6.21 | 3.50 | 13.25 | 12.38 | | |
| October | 13.10 | 9.68 | 9.84 | 5.77 | 3.38 | 12.85 | 11.91 | 12.83 | 9.35 | 9.28 | 6.00 | 3.36 | 12.82 | 11.94 | | |
| November | 13.30 | 10.07 | 10.00 | 5.89 | 3.40 | 12.86 | 11.89 | 12.67 | 9.67 | 9.03 | 5.77 | 3.19 | 12.39 | 11.54 | | |
| December | 14.17 | 10.46 | 10.78 | 6.77 | 3.96 | 13.52 | 12.28 | 13.46 | 10.34 | 9.84 | 6.38 | 3.74 | 12.96 | 11.92 | | |
| Average | 14.94 | 11.68 | 11.77 | 7.13 | 4.18 | ----- | ----- | 14.37 | 11.37 | 10.86 | 6.77 | 3.86 | ----- | ----- | | |
| 1929 | | | | | | | | | | | | | | | | |
| January | 16.39 | 12.27 | 12.44 | 9.14 | 5.87 | 14.69 | 13.12 | 15.70 | 11.91 | 11.82 | 8.32 | 5.34 | 14.82 | 13.54 | | |
| February | 16.64 | 12.89 | 12.95 | 8.76 | 5.89 | 15.23 | 13.62 | 16.01 | 12.29 | 12.00 | 8.62 | 5.50 | 15.18 | 13.98 | | |
| March | 16.99 | 13.34 | 13.29 | 9.63 | 6.28 | 15.58 | 13.88 | 16.26 | 12.66 | 12.29 | 9.25 | 5.92 | 15.26 | 13.84 | | |
| April | 16.87 | 13.74 | 13.28 | 10.20 | 6.52 | 15.87 | 14.11 | 16.56 | 13.35 | 12.66 | 9.56 | 6.05 | 15.34 | 13.75 | | |
| May | 13.78 | 10.78 | 10.88 | 6.88 | 4.33 | ----- | ----- | 13.27 | 10.84 | 10.29 | 6.52 | 3.80 | ----- | ----- | | |
| June | 15.32 | 12.23 | 10.16 | 6.22 | 4.05 | 13.03 | 12.00 | 14.80 | 12.25 | 10.12 | 6.15 | 3.68 | 12.92 | 11.82 | | |
| July | 14.31 | 11.34 | 10.17 | 6.06 | 3.94 | 13.12 | 12.00 | 13.91 | 11.25 | 10.19 | 6.01 | 3.60 | 12.93 | 11.70 | | |
| August | 13.49 | 10.20 | 9.68 | 5.62 | 3.69 | 13.08 | 11.92 | 12.79 | 9.84 | 9.14 | 5.50 | 3.42 | 12.78 | 11.63 | | |
| September | 13.21 | 9.80 | 9.44 | 4.87 | 3.38 | 12.72 | 11.55 | 12.70 | 9.48 | 8.84 | 4.75 | 3.00 | 12.51 | 11.45 | | |
| October | 12.71 | 9.99 | 9.19 | 4.79 | 3.19 | 12.63 | 11.43 | 12.22 | 9.40 | 8.43 | 4.79 | 3.00 | 12.32 | 11.28 | | |
| November | 12.77 | 10.02 | 9.46 | 5.19 | 3.40 | 12.45 | 11.30 | 12.07 | 9.41 | 8.38 | 5.08 | 3.00 | 12.00 | 10.90 | | |
| December | 13.19 | 10.38 | 9.88 | 5.47 | 3.66 | 12.23 | 11.12 | 12.28 | 9.75 | 8.62 | 5.12 | 3.00 | 11.92 | 10.80 | | |
| Average | 14.64 | ----- | 10.90 | 6.90 | 4.52 | ----- | ----- | 14.05 | ----- | 10.23 | 6.64 | 4.11 | ----- | ----- | | |

Bureau of Agricultural Economics. Compiled from data of the livestock and meat-reporting service of the Bureau. Earlier data in 1927 Yearbook, pp. 1032-1034.

TABLE 407.—*Sheep and lambs: Monthly slaughter under Federal inspection, 1907–1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| 1907..... | 1,017 | 837 | 842 | 861 | 769 | 735 | 865 | 900 | 892 | 973 | 793 | 769 | 10,252 |
| 1908..... | 872 | 725 | 677 | 664 | 732 | 842 | 891 | 932 | 1,064 | 1,048 | 928 | 930 | 10,305 |
| 1909..... | 906 | 806 | 903 | 839 | 712 | 843 | 964 | 1,019 | 1,153 | 1,169 | 1,029 | 1,000 | 11,343 |
| 1910..... | 903 | 771 | 727 | 693 | 796 | 927 | 967 | 1,095 | 1,154 | 1,206 | 1,125 | 1,044 | 11,408 |
| 1911..... | 1,130 | 1,019 | 1,059 | 974 | 1,085 | 1,146 | 1,150 | 1,268 | 1,257 | 1,428 | 1,304 | 1,200 | 14,020 |
| 1912..... | 1,383 | 1,151 | 1,106 | 971 | 963 | 1,028 | 1,181 | 1,390 | 1,440 | 1,723 | 1,424 | 1,220 | 14,979 |
| 1913..... | 1,192 | 961 | 883 | 1,049 | 1,127 | 1,135 | 1,273 | 1,243 | 1,486 | 1,514 | 1,258 | 1,284 | 14,406 |
| 1914..... | 1,297 | 1,113 | 1,143 | 1,150 | 1,085 | 1,113 | 1,171 | 1,169 | 1,379 | 1,351 | 1,112 | 1,167 | 14,229 |
| 1915..... | 1,196 | 946 | 986 | 830 | 739 | 883 | 984 | 1,139 | 1,220 | 1,116 | 1,132 | 1,041 | 12,212 |
| 1916..... | 976 | 904 | 861 | 769 | 854 | 990 | 930 | 1,173 | 1,158 | 1,172 | 1,121 | 1,033 | 11,941 |
| 1917..... | 956 | 819 | 861 | 777 | 632 | 710 | 688 | 766 | 740 | 822 | 764 | 809 | 9,346 |
| 1918..... | 780 | 655 | 736 | 614 | 659 | 737 | 869 | 937 | 1,029 | 1,194 | 1,139 | 971 | 10,320 |
| 1919..... | 1,004 | 754 | 738 | 808 | 894 | 951 | 1,160 | 1,234 | 1,292 | 1,414 | 1,227 | 1,235 | 12,691 |
| 1920..... | 955 | 828 | 788 | 714 | 671 | 818 | 1,048 | 1,042 | 1,151 | 1,068 | 968 | 932 | 10,982 |
| 1921..... | 1,068 | 958 | 1,075 | 1,041 | 935 | 1,116 | 1,060 | 1,237 | 1,249 | 1,285 | 1,040 | 890 | 13,005 |
| 1922..... | 954 | 776 | 837 | 739 | 872 | 1,028 | 964 | 1,024 | 1,013 | 981 | 882 | 858 | 10,929 |
| 1923..... | 1,021 | 836 | 977 | 960 | 972 | 914 | 962 | 957 | 990 | 1,046 | 915 | 878 | 11,520 |
| 1924..... | 1,083 | 912 | 868 | 860 | 959 | 975 | 1,051 | 1,063 | 1,150 | 1,148 | 950 | 972 | 11,991 |
| 1925..... | 990 | 854 | 984 | 1,012 | 1,030 | 999 | 1,071 | 1,031 | 1,086 | 1,083 | 979 | 981 | 12,001 |
| 1926..... | 1,039 | 988 | 1,163 | 994 | 959 | 1,081 | 1,042 | 1,093 | 1,224 | 1,167 | 1,039 | 1,172 | 12,961 |
| 1927..... | 1,115 | 1,006 | 1,027 | 960 | 992 | 1,058 | 1,014 | 1,168 | 1,185 | 1,194 | 1,070 | 1,094 | 12,882 |
| 1928..... | 1,151 | 1,048 | 1,016 | 918 | 1,016 | 1,109 | 1,076 | 1,196 | 1,307 | 1,409 | 1,189 | 1,053 | 13,488 |
| 1929..... | 1,150 | 953 | 1,006 | 1,110 | 1,202 | 1,108 | 1,255 | 1,298 | 1,317 | 1,365 | 1,150 | 1,091 | 14,023 |

Bureau of Animal Industry.

TABLE 408.—*Sheep and lambs, slaughter statistics: Source of supply, classification, slaughter costs, weights, and yields, 1923–1929*

| Year and month | Source of supply | | Age classification | | Average live cost per 100 pounds | Average live weight | Dressed weight as percentage of live weight | By-product yield (on basis of live weight) | |
|----------------|------------------|----------|--------------------|---------------------|----------------------------------|---------------------|---|--|--------------|
| | Stock-yards | Other | Sheep | Lambs and yearlings | | | | Edible fat ¹ | Edible offal |
| | Per cent | Per cent | Per cent | Per cent | Dollars | Pounds | Per cent | Per cent | Per cent |
| 1923..... | 85.97 | 14.03 | 13.16 | 86.84 | 12.03 | 80.80 | 48.07 | 2.85 | 1.94 |
| 1924..... | 83.60 | 16.40 | 10.66 | 89.34 | 12.77 | 80.14 | 47.53 | 2.76 | 1.95 |
| 1925..... | 82.44 | 17.56 | 10.30 | 89.70 | 14.22 | 81.58 | 47.82 | 2.74 | 2.24 |
| 1926..... | 84.64 | 15.36 | 9.62 | 90.38 | 12.86 | 81.34 | 47.62 | 2.68 | 2.35 |
| 1927..... | 85.42 | 14.58 | 8.91 | 91.09 | 12.97 | 81.66 | 47.74 | 2.64 | 2.44 |
| 1928..... | 86.31 | 13.69 | 8.26 | 91.74 | 13.53 | 81.93 | 47.36 | 2.52 | 2.49 |
| 1929..... | 83.99 | 16.01 | 8.77 | 91.23 | 13.24 | 82.57 | 47.10 | 2.43 | 2.51 |
| 1920 | | | | | | | | | |
| January..... | 85.80 | 14.20 | 7.41 | 92.59 | 14.97 | 85.32 | 46.43 | 2.75 | 2.33 |
| February..... | 86.37 | 13.63 | 6.88 | 93.12 | 15.44 | 87.82 | 45.97 | 2.82 | 2.57 |
| March..... | 83.16 | 16.84 | 5.85 | 94.15 | 15.94 | 88.28 | 46.07 | 2.63 | 2.53 |
| April..... | 81.10 | 18.90 | 8.44 | 91.56 | 15.85 | 85.06 | 46.88 | 2.75 | 2.50 |
| May..... | 76.72 | 23.28 | 12.88 | 87.12 | 13.82 | 80.60 | 47.95 | 2.70 | 2.48 |
| June..... | 84.93 | 15.07 | 10.06 | 89.94 | 12.83 | 77.96 | 48.70 | 2.46 | 2.69 |
| July..... | 83.19 | 16.81 | 8.04 | 91.96 | 12.95 | 77.68 | 48.08 | 2.23 | 2.55 |
| August..... | 85.86 | 14.14 | 8.61 | 91.39 | 11.91 | 79.90 | 47.43 | 2.14 | 2.47 |
| September..... | 85.02 | 14.98 | 8.56 | 91.44 | 11.62 | 80.39 | 47.49 | 2.15 | 2.43 |
| October..... | 84.72 | 15.28 | 8.79 | 91.21 | 11.35 | 81.44 | 47.50 | 2.19 | 2.60 |
| November..... | 84.79 | 15.21 | 10.32 | 89.69 | 11.28 | 83.54 | 46.82 | 2.17 | 2.49 |
| December..... | 86.45 | 13.55 | 8.35 | 91.65 | 11.82 | 85.89 | 46.76 | 2.22 | 2.51 |

Bureau of Agricultural Economics. Compiled from monthly reports to the bureau from packers and slaughterers, whose slaughtering equaled 75 to 85 per cent of total slaughter under Federal inspection.

¹ Unrendered.

TABLE 409.—Mutton and lamb, frozen: Cold-storage holdings, United States, 1916-1929

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1916..... | 4,976 | 5,286 | 5,812 | 5,084 | 3,858 | 2,525 | 1,939 | 2,098 | 2,135 | 2,579 | 3,465 | 5,000 |
| 1917..... | 4,886 | 5,895 | 4,949 | 4,872 | 4,369 | 3,508 | 4,380 | 3,912 | 2,716 | 2,768 | 4,194 | 5,406 |
| 1918..... | 7,403 | 6,315 | 7,855 | 5,599 | 3,348 | 3,860 | 2,429 | 3,150 | 5,046 | 5,275 | 8,645 | 9,035 |
| 1919..... | 12,760 | 11,360 | 8,013 | 6,505 | 7,623 | 7,718 | 7,279 | 7,263 | 7,817 | 8,318 | 7,804 | 9,409 |
| 1920..... | 10,290 | 7,787 | 5,781 | 3,517 | 2,579 | 5,735 | 4,311 | 2,290 | 11,021 | 25,325 | 46,997 | 56,702 |
| 1921..... | 68,032 | 78,062 | 59,304 | 38,520 | 25,129 | 15,877 | 8,714 | 6,751 | 5,903 | 6,983 | 6,840 | 7,520 |
| 1922..... | 6,444 | 3,914 | 2,803 | 2,878 | 2,071 | 2,310 | 3,720 | 3,308 | 3,370 | 3,473 | 3,458 | 3,633 |
| 1923..... | 4,523 | 5,980 | 5,758 | 6,635 | 5,774 | 4,445 | 3,556 | 2,752 | 1,785 | 1,719 | 1,997 | 2,014 |
| 1924..... | 2,493 | 2,306 | 2,173 | 1,719 | 2,093 | 2,273 | 2,917 | 2,257 | 2,230 | 2,525 | 3,166 | 3,326 |
| 1925..... | 2,949 | 2,336 | 2,294 | 2,090 | 1,998 | 1,913 | 1,535 | 1,349 | 1,339 | 1,112 | 1,435 | 1,549 |
| 1926..... | 1,820 | 2,354 | 3,346 | 3,289 | 2,393 | 1,697 | 1,871 | 1,813 | 1,929 | 2,234 | 2,814 | 3,166 |
| 1927..... | 4,556 | 4,447 | 4,074 | 2,940 | 1,862 | 1,210 | 1,360 | 1,161 | 1,303 | 1,991 | 2,958 | 3,790 |
| 1928..... | 4,408 | 4,404 | 4,020 | 3,252 | 1,828 | 1,276 | 1,947 | 1,822 | 1,691 | 2,113 | 4,321 | 5,472 |
| 1929..... | 5,623 | 4,009 | 3,252 | 3,109 | 2,533 | 2,461 | 3,061 | 2,639 | 3,159 | 4,113 | 4,992 | 5,194 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

NOTE.—A table similar to Table 414, 1928 Yearbook, livestock and meat situation, is omitted.

TABLE 410.—Mutton and lamb: International trade, average 1911-1913, annual 1925-1928

| Country | Year ended Dec. 31 | | | | | | | | | |
|------------------------------------|----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------|-----------------|
| | Average 1911-1913 | | 1925 | | 1926 | | 1927 | | 1928 preliminary | |
| | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports |
| PRINCIPAL EXPORT- ING COUNTRIES | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| New Zealand..... | 0 | 235,509 | 1 | 291,039 | 0 | 279,731 | 0 | 311,135 | 0 | 317,539 |
| Argentina..... | 0 | 148,457 | 0 | 202,576 | 0 | 148,213 | 0 | 183,260 | 0 | 171,106 |
| Australia..... | 7 | 149,958 | 147 | 150,271 | 12 | 185,682 | 16 | 193,520 | 14 | 146,363 |
| Uruguay..... | 0 | 3,262 | 0 | 22,658 | 0 | 50,358 | 0 | 52,102 | 0 | 31,304 |
| Netherlands..... | 76 | 17,212 | 1,069 | 17,082 | 1,472 | 14,308 | 1,255 | 16,084 | 759 | 14,390 |
| Irish Free State..... | 0 | 0 | 486 | 187 | 400 | 55 | 275 | 1,478 | 312 | 2,359 |
| Union of South Africa..... | 1,914 | 75 | 1 | 184 | 0 | 175 | 52 | 133 | 47 | 201 |
| PRINCIPAL IMPORT- ING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 596,899 | 0 | 622,482 | 0 | 613,633 | 0 | 627,303 | 0 | 640,794 | 0 |
| Canada..... | 4,717 | 48 | 1,321 | 2,641 | 1,673 | 1,274 | 1,946 | 1,889 | 2,333 | 1,128 |
| France..... | 930 | 334 | 23,737 | 200 | 20,385 | 146 | 29,822 | 274 | 15,315 | 300 |
| United States..... | 185 | 4,146 | 2,770 | 1,464 | 3,365 | 1,171 | 9,544 | 937 | 9,202 | 1,024 |
| Germany..... | 1,046 | 350 | 2,002 | 2,122 | 8,217 | 361 | 10,083 | 622 | 9,909 | 79 |
| Norway..... | 0 | 0 | 4,666 | 0 | 4,263 | 0 | 4,902 | 0 | 4,358 | 0 |
| Belgium..... | ----- | ----- | 2,904 | 627 | 3,130 | 475 | 3,914 | 839 | 3,970 | 442 |
| Denmark..... | 3,828 | 344 | 1,328 | 35 | 2,214 | 2 | 2,232 | 5 | 736 | 0 |
| Sweden..... | 1,218 | 100 | 731 | 60 | 1,148 | 7 | 1,371 | 29 | 1,089 | 45 |
| Total 16 coun- tries..... | 610,820 | 559,795 | 663,545 | 591,146 | 659,902 | 581,958 | 692,705 | 662,307 | 688,828 | 586,272 |

Bureau of Agricultural Economics. Official sources.

¹ Year ended June 30.

TABLE 411.—*Sheep and lambs: Shipments and slaughter, by States, average 1924-1928, annual 1928*

| Average 1924-1928 | | | | | | | | | | 1928 | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|-------|-----------------|-------|-------------|--|-------------|---------|-------------|-----------------|----------------|--------|-------------|-----------------|-------------|-------------------------------|-------------|-----------------|-------------|---------|--|-----------------|-------------|---------|-------------|-----------------|-------------|---------|-------------|-----------------|-------|---------|
| Shipments and local slaughter | | | | | Inshipments, stocker, feeder, and breeding | | | | | Farm slaughter | | | | | Shipments and local slaughter | | | | | Inshipments, stocker, feeder, and breeding | | | | | Farm slaughter | | | | | | |
| Sheep | | | Lambs | | Sheep | | | Lambs | | Sheep | | | Lambs | | Sheep | | | Lambs | | Sheep | | | Lambs | | Sheep | | | Lambs | | | |
| Head | | Weight per head | Head | | Weight per head | | Head | | Weight per head | | Head | | Weight per head | | Head | | Weight per head | | Head | | Weight per head | | Head | | Weight per head | | Head | | Weight per head | | |
| Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | Thou.-sands | Lbs. | | |
| 8 | 110 | 33 | 65 | 3 | 110 | 3 | 65 | 3 | 110 | 3 | 65 | 3 | 110 | 3 | 65 | 3 | 110 | 3 | 65 | 3 | 110 | 3 | 65 | 3 | 110 | 3 | 65 | 3 | 110 | | |
| 2 | 110 | 5 | 66 | 1 | 110 | 2 | 67 | 1 | 110 | 2 | 67 | 1 | 110 | 2 | 67 | 1 | 110 | 2 | 67 | 1 | 110 | 2 | 67 | 1 | 110 | 2 | 67 | 1 | 110 | | |
| 5 | 111 | 19 | 65 | 1 | 111 | 2 | 67 | 1 | 111 | 2 | 67 | 1 | 111 | 2 | 67 | 1 | 111 | 2 | 67 | 1 | 111 | 2 | 67 | 1 | 111 | 2 | 67 | 1 | 111 | | |
| 2 | 114 | 3 | 68 | 1 | 114 | 2 | 67 | 1 | 114 | 2 | 67 | 1 | 114 | 2 | 67 | 1 | 114 | 2 | 67 | 1 | 114 | 2 | 67 | 1 | 114 | 2 | 67 | 1 | 114 | | |
| 1 | 110 | 2 | 65 | 1 | 110 | 2 | 65 | 1 | 110 | 2 | 65 | 1 | 110 | 2 | 65 | 1 | 110 | 2 | 65 | 1 | 110 | 2 | 65 | 1 | 110 | 2 | 65 | 1 | 110 | | |
| 44 | 115 | 261 | 75 | 4 | 69 | 59 | 8 | 48 | 60 | 8 | 115 | 25 | 75 | 55 | 6,325 | 297 | 22,275 | 75 | 38 | 2,280 | 6 | 690 | 26 | 1,950 | 26 | 1,950 | 6 | 690 | 26 | 1,950 | |
| 49 | 105 | 164 | 70 | 2 | 60 | 5 | 124 | 9 | 71 | 53 | 5,565 | 159 | 11,130 | 53 | 5,565 | 159 | 11,130 | 53 | 5,565 | 159 | 11,130 | 53 | 5,565 | 159 | 11,130 | 53 | 5,565 | 159 | 11,130 | | |
| 113 | 110 | 492 | 72 | 51 | 60 | 19 | 117 | 44 | 72 | 123 | 13,540 | 526 | 37,970 | 123 | 13,540 | 526 | 37,970 | 123 | 13,540 | 526 | 37,970 | 123 | 13,540 | 526 | 37,970 | 123 | 13,540 | 526 | 37,970 | | |
| 156 | 115 | 815 | 70 | 9 | 100 | 146 | 65 | 3 | 120 | 3 | 84 | 145 | 16,675 | 806 | 56,420 | 806 | 56,420 | 806 | 56,420 | 806 | 56,420 | 806 | 56,420 | 806 | 56,420 | 806 | 56,420 | 806 | 56,420 | | |
| 32 | 120 | 517 | 85 | 18 | 100 | 195 | 68 | 1 | 127 | 1 | 84 | 36 | 4,320 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | | |
| 83 | 120 | 617 | 85 | 30 | 96 | 327 | 69 | 1 | 120 | 3 | 84 | 38 | 4,320 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | 470 | 39,450 | | |
| 109 | 115 | 292 | 80 | 16 | 100 | 317 | 70 | 2 | 120 | 7 | 84 | 117 | 14,040 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | | |
| 52 | 110 | 296 | 80 | 23 | 110 | 115 | 70 | 2 | 120 | 7 | 84 | 117 | 14,040 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | 744 | 63,240 | | |
| 55 | 110 | 303 | 79 | 27 | 100 | 352 | 64 | 2 | 120 | 8 | 80 | 62 | 6,820 | 313 | 25,040 | 313 | 25,040 | 313 | 25,040 | 313 | 25,040 | 313 | 25,040 | 313 | 25,040 | 313 | 25,040 | 313 | 25,040 | | |
| 90 | 120 | 738 | 80 | 28 | 100 | 398 | 64 | 2 | 110 | 8 | 80 | 60 | 6,600 | 352 | 28,252 | 352 | 28,252 | 352 | 28,252 | 352 | 28,252 | 352 | 28,252 | 352 | 28,252 | 352 | 28,252 | 352 | 28,252 | | |
| 34 | 110 | 178 | 77 | 42 | 105 | 276 | 65 | 3 | 122 | 4 | 81 | 91 | 10,920 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | | |
| 89 | 110 | 178 | 77 | 43 | 105 | 276 | 65 | 3 | 122 | 4 | 81 | 91 | 10,920 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | 781 | 62,480 | | |
| 34 | 110 | 183 | 80 | 43 | 100 | 318 | 65 | 2 | 116 | 5 | 75 | 83 | 9,130 | 812 | 60,900 | 812 | 60,900 | 812 | 60,900 | 812 | 60,900 | 812 | 60,900 | 812 | 60,900 | 812 | 60,900 | 812 | 60,900 | | |
| 44 | 110 | 297 | 75 | 4 | 110 | 26 | 65 | 2 | 110 | 5 | 75 | 82 | 5,720 | 238 | 19,040 | 238 | 19,040 | 238 | 19,040 | 238 | 19,040 | 238 | 19,040 | 238 | 19,040 | 238 | 19,040 | 238 | 19,040 | | |
| 68 | 110 | 164 | 80 | 50 | 100 | 109 | 65 | 1 | 110 | 2 | 75 | 57 | 6,270 | 323 | 24,225 | 323 | 24,225 | 323 | 24,225 | 323 | 24,225 | 323 | 24,225 | 323 | 24,225 | 323 | 24,225 | 323 | 24,225 | | |
| 52 | 110 | 479 | 89 | 48 | 110 | 348 | 66 | 1 | 110 | 1 | 81 | 56 | 6,160 | 526 | 47,335 | 526 | 47,335 | 526 | 47,335 | 526 | 47,335 | 526 | 47,335 | 526 | 47,335 | 526 | 47,335 | 526 | 47,335 | | |
| 815 | 114 | 7,079 | 82 | 337 | 102 | 3,230 | 66 | 27 | 118 | 47 | 80 | 902 | 103,065 | 7,209 | 589,187 | 7,209 | 589,187 | 7,209 | 589,187 | 7,209 | 589,187 | 7,209 | 589,187 | 7,209 | 589,187 | 7,209 | 589,187 | 7,209 | 589,187 | | |
| 46 | 3,647 | 20 | 3,430 | 265 | 27,155 | 3,209 | 212,050 | 46 | 3,647 | 20 | 3,430 | 265 | 27,155 | 3,209 | 212,050 | 3,209 | 212,050 | 3,209 | 212,050 | 3,209 | 212,050 | 3,209 | 212,050 | 3,209 | 212,050 | 3,209 | 212,050 | 3,209 | 212,050 | 3,209 | 212,050 |

: Preliminary.

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|-------|-----|--------|----|-------|-----|-------|-----|-----|-----|-----|----|-------|---------|--------|-----------|-------|---------|-------|---------|-------|--------|-----|--------|
| Arizona..... | 53 | 105 | 308 | 67 | 2 | 110 | 12 | 70 | 78 | 105 | 27 | 70 | 42 | 4,494 | 305 | 21,359 | 9 | 990 | 30 | 2,100 | 90 | 9,630 | 25 | 1,750 |
| Utah..... | 147 | 110 | 942 | 72 | 9 | 105 | 1 | 65 | 10 | 108 | 21 | 74 | 153 | 16,830 | 1,043 | 76,510 | 20 | 2,100 | 3 | 195 | 7 | 700 | 15 | 1,125 |
| Nevada..... | 72 | 105 | 469 | 67 | 1 | 105 | 1 | 65 | 6 | 108 | 13 | 68 | 109 | 11,445 | 481 | 31,265 | 20 | 2,100 | 3 | 195 | 7 | 700 | 15 | 1,125 |
| Washington..... | 40 | 110 | 329 | 80 | 14 | 100 | 23 | 70 | 2 | 112 | 7 | 80 | 40 | 4,403 | 340 | 27,200 | 1 | 300 | 15 | 1,260 | 2 | 240 | 7 | 560 |
| Oregon..... | 238 | 109 | 755 | 76 | 4 | 110 | --- | --- | 11 | 110 | 5 | 78 | 230 | 24,610 | 869 | 65,044 | 6 | 660 | --- | 10 | 1,100 | 6 | 450 | |
| California..... | 416 | 100 | 1,674 | 70 | 56 | 98 | 497 | 76 | 11 | 110 | 11 | 75 | 386 | 38,600 | 1,910 | 137,520 | 48 | 4,320 | 548 | 43,840 | 10 | 1,100 | 10 | 760 |
| Far Western..... | 2,205 | 107 | 10,452 | 74 | 709 | 105 | 2,510 | 67 | 199 | 106 | 127 | 73 | 2,257 | 941,003 | 11,132 | 838,715 | 767 | 81,650 | 2,474 | 166,381 | 216 | 23,140 | 128 | 9,383 |
| United States..... | 3,887 | 108 | 19,942 | 77 | 1,159 | 104 | 5,835 | 66 | 281 | 107 | 290 | 74 | 4,041 | 432,568 | 20,861 | 1,602,807 | 1,146 | 119,985 | 5,775 | 383,756 | 296 | 32,028 | 269 | 19,770 |

Bureau of Agricultural Economics, Estimates division of Crop and Livestock Estimates.

1 Preliminary.

TABLE 412.—*Sheep and lambs: Value of production and income, average 1924-1928, annual 1928*

| State and division | Average 1924-1928 ¹ | | | | 1928 ¹ | | | |
|---------------------|-----------------------------------|---------------------|---------------|---------------------|-----------------------------------|---------------------|---------------|---------------------|
| | Value of amount consumed on farms | Receipts from sales | Gross income | Value of production | Value of amount consumed on farms | Receipts from sales | Gross income | Value of production |
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Maine..... | 12 | 347 | 360 | 364 | 13 | 342 | 355 | 351 |
| New Hampshire..... | 6 | 75 | 81 | 82 | 5 | 78 | 83 | 78 |
| Vermont..... | 5 | 184 | 188 | 185 | 5 | 175 | 180 | 182 |
| Massachusetts..... | 1 | 52 | 53 | | 2 | 56 | 58 | 54 |
| Rhode Island..... | 1 | 9 | 9 | 9 | | 8 | 8 | 8 |
| Connecticut..... | 1 | 41 | 42 | 40 | 1 | 41 | 42 | 40 |
| New York..... | 29 | 2,625 | 2,653 | 2,650 | 29 | 3,171 | 3,200 | 2,904 |
| New Jersey..... | 2 | 32 | 33 | 33 | 1 | 23 | 24 | 23 |
| Pennsylvania..... | 16 | 1,803 | 1,819 | 1,812 | 15 | 1,814 | 1,829 | 1,823 |
| North Atlantic..... | 72 | 5,167 | 5,239 | 5,228 | 71 | 5,708 | 5,779 | 5,463 |
| Ohio..... | 37 | 7,531 | 7,568 | 7,970 | 48 | 7,672 | 7,720 | 7,861 |
| Indiana..... | 13 | 3,444 | 3,458 | 3,951 | 13 | 3,995 | 4,008 | 4,277 |
| Illinois..... | 32 | 3,464 | 3,496 | 4,113 | 32 | 3,693 | 3,725 | 4,329 |
| Michigan..... | 32 | 5,927 | 5,960 | 6,919 | 25 | 7,063 | 7,088 | 7,879 |
| Wisconsin..... | 44 | 1,916 | 1,960 | 2,282 | 42 | 2,100 | 2,232 | 2,532 |
| Minnesota..... | 74 | 2,647 | 2,722 | 3,209 | 86 | 3,756 | 3,842 | 3,994 |
| Iowa..... | 60 | 4,639 | 4,699 | 5,505 | 61 | 3,998 | 4,069 | 6,963 |
| Missouri..... | 49 | 5,146 | 5,195 | 5,724 | 48 | 5,125 | 5,173 | 5,807 |
| North Dakota..... | 57 | 1,356 | 1,413 | 2,022 | 63 | 2,155 | 2,218 | 2,693 |
| South Dakota..... | 57 | 2,725 | 2,783 | 3,139 | 59 | 3,048 | 3,107 | 3,861 |
| Nebraska..... | 25 | 3,927 | 3,953 | 4,806 | 26 | 3,959 | 3,985 | 5,687 |
| Kansas..... | 15 | 2,203 | 2,218 | 2,820 | 15 | 2,996 | 3,011 | 3,375 |
| North Central..... | 495 | 44,929 | 45,424 | 52,459 | 518 | 49,650 | 50,168 | 58,278 |
| Delaware..... | | 8 | 8 | 8 | | 9 | 9 | 9 |
| Maryland..... | 8 | 694 | 702 | 726 | 8 | 814 | 822 | 873 |
| Virginia..... | 45 | 2,742 | 2,788 | 2,982 | 58 | 3,046 | 3,104 | 3,406 |
| West Virginia..... | 37 | 2,018 | 2,955 | 3,766 | 48 | 3,298 | 3,340 | 3,582 |
| North Carolina..... | 15 | 228 | 243 | 260 | 17 | 286 | 303 | 326 |
| South Carolina..... | 1 | 31 | 33 | 32 | 3 | 33 | 36 | 32 |
| Georgia..... | 9 | 87 | 96 | 88 | 11 | 67 | 78 | 86 |
| Florida..... | | 51 | 51 | 49 | | 53 | 53 | 53 |
| South Atlantic..... | 115 | 6,760 | 6,875 | 7,913 | 145 | 7,606 | 7,751 | 8,367 |
| Kentucky..... | 52 | 5,523 | 5,575 | 6,047 | 77 | 7,207 | 7,284 | 7,588 |
| Tennessee..... | 33 | 1,768 | 1,801 | 1,906 | 46 | 2,189 | 2,235 | 2,294 |
| Alabama..... | 6 | 77 | 83 | 98 | 7 | 57 | 64 | 129 |
| Mississippi..... | 11 | 158 | 169 | 96 | 5 | 92 | 97 | 60 |
| Arkansas..... | 7 | 153 | 159 | 146 | 8 | 166 | 174 | 148 |
| Louisiana..... | 14 | 108 | 122 | 113 | 18 | 94 | 112 | 125 |
| Oklahoma..... | 14 | 221 | 235 | 311 | 13 | 303 | 316 | 411 |
| Texas..... | 93 | 5,662 | 5,756 | 8,604 | 100 | 5,697 | 5,797 | 9,768 |
| South Central..... | 230 | 13,670 | 13,900 | 17,322 | 274 | 15,805 | 16,079 | 20,523 |
| Montana..... | 102 | 8,658 | 8,760 | 11,646 | 133 | 9,626 | 9,759 | 14,018 |
| Idaho..... | 103 | 9,703 | 9,806 | 10,997 | 110 | 11,322 | 11,432 | 12,940 |
| Wyoming..... | 102 | 9,023 | 9,125 | 10,711 | 115 | 10,012 | 10,127 | 12,410 |
| Colorado..... | 147 | 8,219 | 8,365 | 9,128 | 147 | 9,264 | 9,411 | 9,526 |
| New Mexico..... | 414 | 4,885 | 5,299 | 5,840 | 436 | 4,561 | 5,026 | 5,061 |
| Arizona..... | 760 | 2,880 | 3,630 | 3,501 | 780 | 3,204 | 3,984 | 3,772 |
| Utah..... | 231 | 8,731 | 8,961 | 9,718 | 267 | 9,777 | 10,034 | 11,240 |
| Nevada..... | 119 | 3,885 | 4,006 | 4,316 | 136 | 4,074 | 4,210 | 4,485 |
| Washington..... | 30 | 2,765 | 2,794 | 3,060 | 32 | 3,153 | 3,185 | 3,396 |
| Oregon..... | 87 | 8,359 | 8,446 | 9,388 | 88 | 9,507 | 9,595 | 10,764 |
| California..... | 138 | 12,353 | 12,491 | 13,956 | 131 | 14,987 | 15,098 | 17,358 |
| Far Western..... | 2,224 | 79,460 | 81,684 | 92,250 | 2,364 | 89,497 | 91,861 | 104,939 |
| United States..... | 3,136 | 149,986 | 153,122 | 175,180 | 3,372 | 168,266 | 171,638 | 197,576 |

Bureau of Agricultural Economics. Estimates division Crop and Livestock Estimates.

¹ Preliminary.

TABLE 413.—*Wool, raw: Production, imports, exports, and amount available for consumption, United States, 1910-1929*

| Year | Production | | | Im-ports ¹ | Reex-ports ¹ | Exports of domestic wool | Net imports ² | Avail-able for con-sumption |
|-------------------------|--------------|--------------|--------------|-----------------------|-------------------------|--------------------------|--------------------------|-----------------------------|
| | Fleece | Pulled | Total | | | | | |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1910..... | 281,363 | 40,000 | 321,363 | 180,135 | 9,055 | ³ 48 | 171,032 | 492,395 |
| 1911..... | 277,548 | 41,000 | 318,548 | 155,923 | 3,511 | (⁴) | 152,412 | 470,960 |
| 1912..... | 262,543 | 41,500 | 304,043 | 238,118 | 1,816 | (⁵) | 236,302 | 540,345 |
| 1913..... | 252,675 | 43,500 | 296,175 | 151,581 | 3,800 | ⁶ 77 | 147,644 | 443,819 |
| 1914..... | 247,192 | 43,000 | 290,192 | 256,501 | 6,342 | ⁶ 335 | 249,823 | 540,015 |
| 1915..... | 245,726 | 40,000 | 285,726 | 402,611 | 2,081 | ⁶ 8,158 | 392,372 | 678,098 |
| 1916..... | 244,890 | 43,600 | 288,490 | 442,650 | 2,128 | 3,919 | 436,603 | 725,093 |
| 1917..... | 241,892 | 40,000 | 281,892 | 416,137 | 1,272 | 1,827 | 413,038 | 694,930 |
| 1918..... | 256,870 | 42,000 | 298,870 | 447,426 | 452 | 407 | 446,567 | 745,437 |
| 1919..... | 249,958 | 48,300 | 298,258 | 438,782 | 5,134 | 2,840 | 430,807 | 729,065 |
| 1920..... | 244,179 | 42,900 | 287,079 | 254,905 | 12,393 | 8,845 | 233,066 | 520,745 |
| 1921..... | 235,129 | 48,500 | 283,629 | 316,605 | 1,552 | 1,927 | 313,126 | 596,755 |
| 1922..... | 221,713 | 42,000 | 263,713 | 366,538 | 4,225 | 453 | 361,861 | 625,574 |
| 1923..... | 225,696 | 42,500 | 268,196 | 388,345 | 23,557 | 535 | 364,253 | 632,449 |
| 1924..... | 235,575 | 43,800 | 279,375 | 262,655 | 27,476 | 309 | 234,869 | 514,244 |
| 1925..... | 245,562 | 46,800 | 292,362 | 336,646 | 7,087 | 273 | 329,286 | 621,648 |
| 1926..... | 260,976 | 50,600 | 311,576 | 299,451 | 14,082 | 292 | 285,077 | 596,653 |
| 1927..... | 281,914 | 50,100 | 332,014 | 264,507 | 10,710 | 323 | 253,474 | 585,488 |
| 1928..... | 303,715 | 51,900 | 355,615 | 240,360 | 4,435 | 485 | 235,440 | 591,055 |
| 1929 ⁶ | 308,947 | 54,500 | 363,447 | 277,204 | 2,380 | 239 | 274,585 | 638,032 |

Bureau of Agricultural Economics. Production figures 1910-1913 from the National Association of Wool Manufacturers; 1914-1928 from the bureau; imports and exports from the Bureau of Foreign and Domestic Commerce.

¹ Hair of Angora goat, alpaca, and other like animals included in imports and reexports prior to 1914 and in exports for all years.

² Total imports minus domestic exports and reexports.

³ Exports for fiscal years ended June 30 of the years shown.

⁴ Included in all other articles.

⁵ No transactions.

⁶ Preliminary.

TABLE 414.—Wool, fleeces: Estimated production, by States, 1926-1929

| State and division | Production | | | | Weight per fleece ¹ | | | | Number of fleeces ¹ | | | |
|---------------------|--------------|--------------|--------------|-------------------|--------------------------------|------|------|-------------------|--------------------------------|------------|------------|-------------------|
| | 1926 | 1927 | 1928 | 1929 ² | 1926 | 1927 | 1928 | 1929 ³ | 1926 | 1927 | 1928 | 1929 ³ |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | Lbs. | Lbs. | Lbs. | Lbs. | Thou-sands | Thou-sands | Thou-sands | Thou-sands |
| Maine..... | 559 | 548 | 542 | 533 | 6.5 | 6.5 | 6.3 | 6.2 | 86 | 84 | 86 | 86 |
| New Hampshire..... | 110 | 117 | 115 | 112 | 6.5 | 6.5 | 6.4 | 6.2 | 17 | 18 | 18 | 18 |
| Vermont..... | 277 | 285 | 280 | 291 | 7.3 | 7.3 | 7.0 | 7.1 | 38 | 39 | 40 | 41 |
| Massachusetts..... | 62 | 63 | 66 | 65 | 6.2 | 6.3 | 6.6 | 6.5 | 10 | 10 | 10 | 10 |
| Rhode Island..... | 12 | 12 | 13 | 13 | 6.2 | 6.2 | 6.4 | 6.4 | 2 | 2 | 2 | 2 |
| Connecticut..... | 43 | 36 | 42 | 42 | 6.1 | 6.0 | 6.0 | 6.0 | 7 | 6 | 7 | 7 |
| New York..... | 3,081 | 2,956 | 2,966 | 2,765 | 7.3 | 7.3 | 7.2 | 7.2 | 422 | 405 | 412 | 384 |
| New Jersey..... | 32 | 32 | 30 | 30 | 6.3 | 6.3 | 6.1 | 6.1 | 5 | 5 | 5 | 5 |
| Pennsylvania..... | 2,805 | 2,730 | 2,948 | 3,017 | 7.5 | 7.5 | 7.5 | 7.6 | 374 | 364 | 393 | 397 |
| North Atlantic..... | 6,981 | 6,777 | 7,002 | 6,868 | 7.3 | 7.3 | 7.2 | 7.2 | 961 | 933 | 973 | 950 |
| Ohio..... | 14,760 | 15,662 | 15,826 | 15,512 | 8.2 | 8.2 | 8.2 | 8.1 | 1,800 | 1,910 | 1,930 | 1,915 |
| Indiana..... | 3,715 | 4,088 | 4,307 | 4,644 | 7.4 | 7.3 | 7.3 | 7.2 | 502 | 560 | 590 | 645 |
| Illinois..... | 3,648 | 4,162 | 3,724 | 3,600 | 7.6 | 7.5 | 7.6 | 7.5 | 480 | 555 | 490 | 480 |
| Michigan..... | 7,920 | 8,272 | 8,520 | 8,580 | 8.0 | 8.0 | 8.0 | 7.8 | 990 | 1,034 | 1,065 | 1,100 |
| Wisconsin..... | 2,508 | 2,774 | 2,808 | 2,734 | 7.6 | 7.6 | 7.8 | 7.7 | 330 | 365 | 360 | 355 |
| Minnesota..... | 3,634 | 4,211 | 4,661 | 4,938 | 7.9 | 7.9 | 7.9 | 7.9 | 460 | 533 | 590 | 625 |
| Iowa..... | 5,440 | 5,896 | 5,960 | 6,202 | 8.0 | 8.0 | 8.0 | 7.9 | 680 | 737 | 745 | 785 |
| Missouri..... | 5,250 | 5,523 | 5,962 | 6,000 | 7.0 | 7.0 | 7.2 | 7.1 | 750 | 789 | 828 | 845 |
| North Dakota..... | 2,772 | 3,469 | 3,984 | 4,403 | 8.3 | 8.3 | 8.3 | 8.2 | 334 | 418 | 480 | 537 |
| South Dakota..... | 4,714 | 5,160 | 5,644 | 5,636 | 8.1 | 8.0 | 8.3 | 7.7 | 582 | 645 | 680 | 732 |
| Nebraska..... | 2,175 | 2,442 | 2,370 | 2,668 | 7.5 | 6.6 | 7.9 | 7.6 | 290 | 370 | 300 | 351 |
| Kansas..... | 1,679 | 1,986 | 2,442 | 2,467 | 7.3 | 7.3 | 7.4 | 7.3 | 230 | 272 | 330 | 338 |
| North Central..... | 58,215 | 63,645 | 66,208 | 67,384 | 7.8 | 7.8 | 7.9 | 7.7 | 7,428 | 8,188 | 8,388 | 8,708 |
| Delaware..... | 12 | 12 | 12 | 12 | 6.0 | 6.0 | 6.0 | 6.0 | 2 | 2 | 2 | 2 |
| Maryland..... | 472 | 504 | 518 | 573 | 6.3 | 6.3 | 6.1 | 6.3 | 75 | 80 | 85 | 91 |
| Virginia..... | 1,630 | 1,710 | 1,895 | 2,194 | 5.0 | 5.0 | 5.0 | 5.2 | 326 | 342 | 379 | 422 |
| West Virginia..... | 2,311 | 2,457 | 2,684 | 2,798 | 5.3 | 5.4 | 5.4 | 5.3 | 436 | 455 | 497 | 528 |
| North Carolina..... | 304 | 350 | 357 | 376 | 4.6 | 4.8 | 4.7 | 4.7 | 66 | 73 | 76 | 80 |
| South Carolina..... | 45 | 50 | 52 | 52 | 4.1 | 4.2 | 4.0 | 4.0 | 11 | 12 | 13 | 13 |
| Georgia..... | 139 | 148 | 126 | 125 | 3.4 | 3.6 | 3.4 | 3.3 | 41 | 41 | 37 | 38 |
| Florida..... | 144 | 144 | 153 | 150 | 3.0 | 3.0 | 3.0 | 3.0 | 48 | 48 | 51 | 50 |
| South Atlantic..... | 5,057 | 5,375 | 5,797 | 6,280 | 5.0 | 5.1 | 5.1 | 5.1 | 1,005 | 1,053 | 1,140 | 1,224 |
| Kentucky..... | 3,278 | 3,845 | 4,051 | 4,305 | 4.8 | 4.8 | 4.7 | 4.7 | 683 | 801 | 862 | 916 |
| Tennessee..... | 1,118 | 1,174 | 1,287 | 1,312 | 4.3 | 4.3 | 4.1 | 4.1 | 260 | 273 | 314 | 320 |
| Alabama..... | 136 | 155 | 184 | 221 | 3.5 | 3.6 | 3.4 | 3.4 | 39 | 43 | 54 | 65 |
| Mississippi..... | 268 | 198 | 115 | 96 | 3.2 | 3.2 | 3.1 | 3.1 | 90 | 62 | 37 | 31 |
| Arkansas..... | 201 | 220 | 207 | 202 | 4.9 | 4.9 | 4.6 | 4.8 | 41 | 45 | 45 | 42 |
| Louisiana..... | 275 | 286 | 282 | 306 | 3.2 | 3.1 | 3.2 | 3.4 | 86 | 84 | 88 | 90 |
| Oklahoma..... | 456 | 562 | 615 | 664 | 7.6 | 7.7 | 7.5 | 7.3 | 60 | 73 | 82 | 91 |
| Texas..... | 27,297 | 32,725 | 35,591 | 39,882 | 8.1 | 8.5 | 8.4 | 8.5 | 3,370 | 3,850 | 4,237 | 4,692 |
| South Central..... | 33,049 | 39,165 | 42,332 | 46,988 | 7.1 | 7.5 | 7.4 | 7.5 | 4,629 | 5,231 | 5,719 | 6,247 |
| Montana..... | 23,320 | 24,166 | 26,626 | 29,077 | 8.8 | 8.6 | 8.6 | 8.6 | 2,650 | 2,810 | 3,096 | 3,381 |
| Idaho..... | 14,507 | 15,840 | 17,885 | 17,829 | 8.9 | 8.8 | 9.2 | 8.8 | 1,630 | 1,800 | 1,944 | 2,026 |
| Wyoming..... | 22,338 | 25,317 | 26,488 | 24,200 | 8.5 | 8.7 | 8.8 | 8.0 | 2,628 | 2,910 | 3,010 | 3,025 |
| Colorado..... | 7,740 | 8,118 | 8,831 | 8,655 | 7.5 | 7.3 | 7.6 | 7.1 | 1,032 | 1,112 | 1,162 | 1,219 |
| New Mexico..... | 12,060 | 12,600 | 12,400 | 12,892 | 5.9 | 6.0 | 5.8 | 6.0 | 2,044 | 2,100 | 2,138 | 2,147 |
| Arizona..... | 6,758 | 6,240 | 5,760 | 5,784 | 6.2 | 6.0 | 6.0 | 6.0 | 1,090 | 1,040 | 960 | 904 |
| Utah..... | 19,430 | 19,975 | 22,072 | 19,764 | 8.8 | 8.5 | 8.9 | 8.1 | 2,208 | 2,350 | 2,480 | 2,440 |
| Nevada..... | 8,730 | 8,015 | 8,580 | 7,560 | 7.9 | 7.3 | 7.5 | 7.0 | 1,105 | 1,098 | 1,144 | 1,080 |
| Washington..... | 4,194 | 4,753 | 5,000 | 4,554 | 9.8 | 9.8 | 10.0 | 9.0 | 428 | 485 | 500 | 506 |
| Oregon..... | 18,321 | 18,128 | 20,332 | 18,849 | 9.3 | 8.8 | 9.2 | 8.3 | 1,970 | 2,060 | 2,210 | 2,271 |
| California..... | 20,276 | 23,800 | 23,800 | 25,192 | 7.4 | 7.0 | 6.8 | 6.7 | 2,740 | 3,400 | 3,500 | 3,760 |
| Far Western..... | 157,674 | 166,952 | 177,774 | 174,346 | 8.1 | 7.9 | 8.0 | 7.6 | 19,525 | 21,165 | 22,144 | 22,819 |
| United States..... | 260,976 | 281,914 | 299,113 | 301,866 | 7.8 | 7.7 | 7.8 | 7.6 | 33,548 | 36,570 | 38,364 | 39,948 |

Bureau of Agricultural Economics. Revised figures for 1928 and 1929 may be found in March, 1930, Crops and Markets.

¹ In States where sheep are shorn twice a year, principally Texas and California, this figure covers wool per head of sheep shorn and not weight per fleeces.

² Includes some fleeces taken at commercial feeding plants. California figure includes some fleeces taken from early lambs.

³ Preliminary.

TABLE 415.—*Stocks of wool, tops, and noils held by dealers and manufacturers in United States, 1925-1929*¹

| Date | Held by dealers | | | | | Held by manufacturers | | | | |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------------|-----------------|-----------------|-----------------|-----------------|
| | Grease | Scoured | Pulled | Tops | Noils | Grease | Scoured | Pulled | Tops | Noils |
| 1925 | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Jan. 1..... | 98,712 | 18,380 | 9,799 | 3,285 | 2,583 | 113,026 | 15,315 | 7,368 | 16,258 | 6,729 |
| Apr. 1..... | 65,912 | 16,819 | 12,624 | 2,754 | 2,412 | 95,122 | 15,437 | 7,025 | 15,921 | 6,020 |
| July 1..... | 147,654 | 15,039 | 11,267 | 2,571 | 3,292 | 95,021 | 16,455 | 7,381 | 15,252 | 5,463 |
| Oct. 1..... | 136,043 | 15,809 | 9,715 | 2,240 | 2,704 | 102,261 | 13,621 | 6,623 | 15,880 | 6,207 |
| 1926 | | | | | | | | | | |
| Jan. 1..... | 117,726 | 14,658 | 10,552 | 2,428 | 2,407 | 97,162 | 12,666 | 7,852 | 15,346 | 6,121 |
| Apr. 1..... | 97,552 | 15,053 | 12,360 | 2,692 | 2,641 | 95,102 | 14,358 | 7,468 | 15,188 | 6,184 |
| July 1..... | 182,685 | 12,204 | 10,141 | 2,438 | 3,090 | 91,852 | 12,640 | 6,877 | 14,104 | 5,633 |
| Oct. 1..... | 166,380 | 12,810 | 8,709 | 2,310 | 2,769 | 90,992 | 12,407 | 6,376 | 13,771 | 5,047 |
| 1927 | | | | | | | | | | |
| Jan. 1..... | 114,680 | 13,176 | 9,029 | 2,282 | 3,392 | 90,494 | 11,699 | 6,322 | 13,653 | 5,266 |
| Apr. 1..... | 81,869 | 11,923 | 9,851 | 2,140 | 3,409 | 90,805 | 12,486 | 6,095 | 13,858 | 5,045 |
| July 1..... | 177,315 | 9,111 | 7,914 | 2,864 | 3,186 | 96,091 | 12,709 | 5,758 | 14,641 | 4,479 |
| Oct. 1..... | 147,079 | 9,390 | 5,075 | 1,677 | 2,846 | 103,886 | 12,937 | 6,170 | 14,581 | 4,144 |
| 1928 | | | | | | | | | | |
| Jan. 1..... | 97,787 | 8,775 | 6,351 | 3,208 | 2,495 | 98,577 | 13,134 | 5,416 | 13,654 | 4,542 |
| Apr. 1..... | 50,989 | 7,907 | 7,761 | 2,056 | 2,305 | 99,319 | 14,632 | 7,902 | 13,447 | 4,932 |
| July 1..... | 171,077 | 10,133 | 8,393 | 1,769 | 2,889 | 105,117 | 13,363 | 5,734 | 12,559 | 4,475 |
| Oct. 1..... | 170,143 | 9,695 | 8,998 | 2,282 | 2,688 | 94,752 | 11,469 | 5,409 | 12,294 | 4,428 |
| 1929 | | | | | | | | | | |
| Jan. 1..... | 112,142 | 10,208 | 10,575 | 1,415 | 3,842 | 90,290 | 11,814 | 4,559 | 12,051 | 4,148 |
| Apr. 1..... | 72,515 | 10,263 | 9,669 | 2,379 | 3,691 | 95,965 | 12,351 | 6,290 | 11,727 | 4,315 |
| July 1..... | 147,292 | 9,413 | 9,788 | 2,862 | 3,404 | 95,208 | 11,568 | 5,274 | 11,229 | 4,481 |
| Oct. 1..... | 160,786 | 10,345 | 8,907 | 2,696 | 3,624 | 98,812 | 11,664 | 5,980 | 11,852 | 4,917 |

Bureau of Agricultural Economics. Compiled from wool stock reports issued quarterly by the Bureau of Agricultural Economics and the Bureau of the Census. Stocks held by the Government are not included.

¹ Not including estimates for firms not reporting nor wool actually reported but for which no grade was stated. Beginning with 1922 estimates for firms not reporting were discontinued. The information in this table is, therefore, not complete as some firms do not report.

NOTE.—A table similar to Table 420, 1928 Yearbook, wool used in manufactures, is omitted.

TABLE 416.—*Wool: International trade, average 1909-1913, annual 1925-1928*

| Country | Year ended Dec. 31 | | | | | | | |
|--------------------------------------|---------------------|---------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|---------------------|
| | Average, 1909-1913 | | 1926 | | 1927 | | 1928 preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Australia..... | 324 | 676, 079 | ¹ 2, 542 | ¹ 781, 279 | ¹ 5, 563 | ¹ 763, 556 | ----- | ----- |
| Argentina..... | 214 | 328, 204 | 208 | 318, 302 | 417 | 346, 010 | ----- | 276, 463 |
| New Zealand..... | 168 | 194, 801 | 201 | 213, 154 | 35 | 220, 561 | 89 | 226, 806 |
| Union of South Africa..... | 7 | 164, 635 | 514 | 222, 836 | 563 | 271, 016 | 943 | 261, 2. 1 |
| Uruguay..... | 0 | 139, 178 | 0 | 118, 762 | 0 | 151, 789 | 0 | 117, 773 |
| China..... | 0 | 42, 685 | 725 | 33, 040 | 391 | 57, 510 | 421 | 73, 623 |
| British India..... | 23, 721 | 56, 496 | 25, 803 | 40, 375 | 32, 191 | 47, 292 | 32, 657 | 57, 649 |
| Chile..... | 1, 247 | 28, 223 | 321 | 24, 726 | ----- | 27, 407 | ----- | 29, 895 |
| Algeria..... | 2, 445 | 19, 871 | 4, 522 | 30, 757 | 3, 212 | 26, 662 | 3, 816 | 26, 526 |
| Morocco..... | 0 | 8, 607 | 0 | 17, 174 | 0 | 16, 074 | ----- | ----- |
| Irish Free State..... | 0 | 0 | 1, 529 | 11, 610 | 1, 640 | 16, 469 | 865 | 12, 284 |
| Spain..... | 2, 466 | 28, 505 | 5, 054 | 6, 707 | ¹ 3, 774 | ¹ 17, 435 | ----- | ----- |
| Peru..... | ¹ 3 | 9, 333 | 0 | 9, 200 | 0 | 11, 057 | 0 | 12, 411 |
| Hungary..... | 0 | 0 | 1, 529 | 13, 460 | 2, 120 | 9, 897 | 3, 351 | 9, 981 |
| Persia ² | ² 2, 753 | 10, 023 | 1, 351 | 13, 490 | 1, 354 | 9, 952 | ----- | ----- |
| Brazil..... | ----- | ² 2, 959 | ----- | 15, 886 | ----- | 11, 054 | ----- | 10, 161 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | |
| France..... | 601, 628 | 84, 973 | 639, 786 | 46, 241 | 686, 796 | 59, 151 | 611, 755 | 60, 069 |
| United Kingdom..... | 506, 155 | 41, 164 | 484, 602 | 54, 395 | 506, 463 | 62, 021 | 463, 934 | 48, 195 |
| United States..... | 203, 298 | ⁴ 46 | 310, 266 | 292 | 267, 287 | 323 | 244, 630 | 485 |
| Germany..... | 481, 988 | 42, 187 | 326, 123 | 16, 933 | 424, 775 | 22, 814 | 380, 649 | 26, 542 |
| Belgium..... | 300, 367 | 196, 440 | 115, 320 | 201 | 146, 875 | 156 | 140, 513 | 215 |
| Italy..... | 30, 145 | 3, 933 | 102, 760 | 8, 190 | 88, 744 | 7, 786 | 106, 916 | 8, 258 |
| Japan..... | 17, 921 | 0 | 73, 370 | 0 | 99, 589 | 0 | 115, 280 | 0 |
| Czechoslovakia..... | 0 | 0 | 30, 306 | 4, 034 | 39, 009 | 3, 586 | 37, 921 | 3, 194 |
| Poland..... | 0 | 0 | 25, 828 | 1, 349 | 36, 019 | 971 | 30, 487 | 1, 545 |
| Russia..... | 106, 184 | 32, 406 | 18, 305 | ¹ 4, 334 | 27, 207 | ¹ 3, 426 | 34, 354 | ----- |
| Canada..... | 7, 794 | 1, 323 | 15, 378 | 4, 389 | 14, 354 | 11, 357 | 14, 271 | 8, 351 |
| Austria..... | 63, 942 | 9, 622 | 14, 348 | 1, 084 | 17, 160 | 879 | 16, 411 | 853 |
| Switzerland..... | 11, 211 | 338 | 18, 237 | 40 | 18, 887 | 46 | 17, 202 | 35 |
| Netherlands..... | 31, 991 | 26, 362 | 9, 902 | 2, 746 | 11, 839 | 3, 413 | 16, 457 | 2, 924 |
| Yugoslavia..... | 0 | 0 | 8, 146 | 84 | 7, 843 | 89 | 3, 017 | 243 |
| Sweden..... | 7, 267 | 149 | 9, 903 | 85 | 11, 623 | 310 | 11, 829 | 375 |
| Bulgaria..... | ⁴ 1, 485 | ⁴ 117 | 1, 859 | 0 | 2, 199 | 3 | 2, 715 | ----- |
| Finland..... | 1, 794 | 30 | 2, 628 | ----- | 3, 533 | ----- | 3, 369 | ----- |
| Norway..... | 3, 644 | 123 | 1, 761 | 331 | 2, 127 | 554 | 1, 717 | 1, 113 |
| Denmark..... | 2, 337 | 1, 124 | 2, 388 | 306 | 3, 287 | 381 | 2, 569 | 534 |
| Greece..... | 281 | 294 | 2, 055 | 599 | 2, 066 | 862 | 2, 387 | 529 |
| Rumania..... | 2, 473 | 3, 538 | 2, 452 | 653 | ----- | ----- | ----- | ----- |
| Total 38 countries..... | 2, 415, 233 | 2, 154, 998 | 2, 260, 036 | 2, 017, 044 | 2, 468, 942 | 2, 181, 809 | 2, 294, 525 | 1, 278, 242 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. "Wool" in this table includes: Washed, unwashed, scoured, pulled wool, slipes, also hair—goat, camel, mohair, angora goat, cashmere goat and alpaca. The following items have been considered as not within this classification: Carded, combed, dyed wool, flecks, sheep, lamb and goat skins with hair on, mill waste, noils, and tops.

¹ International Yearbook of Agricultural Statistics.

² 3-year average.

³ Figures for Persia are for 12 months ended Mar. 21 of the year following year shown.

⁴ 4-year average.

⁵ 1 year only.

TABLE 417.—Wool: *Estimated production in the grease, average 1909-1913, annual 1924-1929*

| Country | Average, 1909- 1913 ¹ | 1924 | 1925 | 1926 | 1927 | 1928 | 1929, prelim- inary |
|--|--|-----------------|-----------------|-----------------|----------------------|----------------------|---------------------------|
| United States. | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Fleece..... | 272, 248 | 235, 575 | 245, 562 | 200, 878 | 281, 914 | 299, 113 | 301, 866 |
| Pulled..... | 41, 400 | 43, 800 | 46, 800 | 49, 000 | 50, 100 | 51, 900 | ----- |
| Total..... | 313, 648 | 279, 375 | 292, 362 | 310, 578 | 332, 014 | 351, 013 | ----- |
| Canada..... | 13, 188 | 15, 112 | 15, 503 | 17, 960 | 18, 673 | 19, 611 | ² 21, 000 |
| United Kingdom and Irish Free State..... | 136, 031 | 104, 668 | 109, 853 | 114, 567 | 118, 537 | 119, 690 | 117, 899 |
| France..... | 81, 600 | 44, 092 | 44, 974 | 46, 517 | ² 50, 180 | ² 49, 840 | ² 48, 580 |
| Germany..... | 43, 893 | 51, 960 | 50, 160 | 41, 830 | 35, 900 | ² 33, 600 | ² 31, 900 |
| Argentina..... | 332, 321 | 316, 000 | 319, 000 | 363, 000 | 331, 000 | 343, 000 | ² 330, 000 |
| Uruguay..... | 133, 101 | 97, 000 | 116, 000 | 129, 000 | 131, 000 | 139, 000 | ² 150, 000 |
| Australia..... | 727, 709 | 776, 882 | 833, 739 | 924, 411 | 888, 130 | 950, 000 | ² 925, 000 |
| New Zealand ⁴ | 179, 942 | 208, 269 | 200, 205 | 202, 386 | 228, 960 | 239, 002 | ² 255, 000 |
| Union of South Africa..... | 157, 690 | 175, 718 | 235, 081 | 249, 159 | 273, 000 | 283, 000 | ² 302, 000 |
| Total above countries ⁵ | 2, 077, 713 | 2, 025, 276 | 2, 170, 127 | 2, 349, 806 | 2, 357, 294 | 2, 475, 856 | 2, 483, 215 |
| Estimated world total, excluding Russia and China ⁶ | 2, 762, 000 | 2, 728, 000 | 2, 903, 000 | 3, 089, 000 | 3, 087, 000 | 3, 207, 000 | ----- |
| Russia..... | ⁷ 330, 311 | 164, 700 | 261, 000 | 301, 800 | 329, 800 | 350, 250 | ----- |
| China, exports..... | 37, 318 | 64, 709 | 56, 817 | 27, 791 | 48, 037 | 64, 845 | ----- |

Bureau of Agricultural Economics. Includes wool shorn in the spring in the Northern Hemisphere and that shorn in the last few months of the same calendar year in the Southern Hemisphere. For complete reference to sources, unless given below, see Foreign Crops and Markets, Feb. 11, 1929.

¹ Average for years 1909-1913 whenever available, otherwise for any year or years within or near this period for which estimates are available.

² Based on official estimates of sheep numbers at date nearest shearing time.

³ Estimate furnished by International Institute of Agriculture.

⁴ Dalgety & Co.'s estimate.

⁵ Excluding pulled wool in the United States.

⁶ Totals subject to revision. Few countries publish official wool production figures. In the absence of official figures for most countries various estimates have been used. Some have been supplied by Government representatives abroad; others are based on sheep numbers at the date nearest shearing time. For some principal exporting countries, exports alone, or exports, stocks, and domestic consumption have been used as representing production. In the case of some Asiatic countries rough commercial estimates have been used, while the figures of the United States Department of Commerce or the National Association of Wool Manufacturers have been used for some other countries.

⁷ Year 1916.

TABLE 418.—Wool (unwashed): *Estimated price per pound, received by producers United States, 1910-1929*

| Year | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Weight- ed av- erage |
|-----------|------------|------------|------------|------------|-----------|------------|------------|------------|-------------|------------|------------|------------|----------------------------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1910..... | 24.5 | 24.6 | 24.9 | 22.3 | 22.8 | 19.5 | 19.0 | 19.5 | 17.7 | 18.1 | 17.9 | 17.8 | 20.5 |
| 1911..... | 17.3 | 17.3 | 16.8 | 15.7 | 14.7 | 15.5 | 15.4 | 16.0 | 15.6 | 15.5 | 15.6 | 15.5 | 15.6 |
| 1912..... | 16.2 | 16.3 | 16.9 | 17.3 | 17.8 | 18.7 | 18.9 | 18.8 | 18.7 | 18.5 | 18.6 | 18.6 | 18.1 |
| 1913..... | 18.6 | 18.7 | 18.4 | 17.7 | 16.3 | 15.6 | 15.9 | 15.8 | 15.8 | 15.5 | 15.6 | 16.1 | 16.4 |
| 1914..... | 15.7 | 15.7 | 16.4 | 16.8 | 17.2 | 18.4 | 18.5 | 18.7 | 18.6 | 18.0 | 18.1 | 18.6 | 17.7 |
| 1915..... | 18.6 | 20.2 | 22.8 | 22.7 | 22.0 | 23.7 | 24.2 | 23.8 | 23.3 | 22.7 | 22.7 | 23.3 | 22.8 |
| 1916..... | 23.3 | 24.2 | 25.9 | 26.3 | 28.0 | 28.7 | 28.6 | 29.0 | 28.4 | 28.7 | 29.4 | 30.8 | 27.9 |
| 1917..... | 31.8 | 32.7 | 36.7 | 38.8 | 43.7 | 49.8 | 54.3 | 54.8 | 54.2 | 55.5 | 55.9 | 58.2 | 47.8 |
| 1918..... | 58.1 | 57.1 | 60.0 | 60.0 | 58.2 | 57.4 | 57.5 | 57.4 | 57.7 | 57.7 | 56.4 | 56.2 | 57.9 |
| 1919..... | 55.2 | 51.1 | 51.3 | 47.9 | 48.0 | 50.5 | 51.8 | 52.2 | 51.3 | 50.6 | 51.0 | 51.6 | 50.3 |
| 1920..... | 53.3 | 52.5 | 51.5 | 51.3 | 50.3 | 38.6 | 29.5 | 28.3 | 28.0 | 27.5 | 24.9 | 21.9 | 39.1 |
| 1921..... | 19.6 | 19.8 | 18.9 | 17.9 | 16.0 | 15.4 | 15.5 | 15.4 | 15.5 | 15.8 | 15.6 | 16.9 | 16.4 |
| 1922..... | 18.0 | 22.3 | 25.0 | 24.8 | 29.0 | 32.8 | 32.5 | 31.6 | 31.6 | 32.2 | 33.2 | 35.3 | 29.8 |
| 1923..... | 35.3 | 35.3 | 37.3 | 39.2 | 41.7 | 41.5 | 38.3 | 37.0 | 37.1 | 36.9 | 36.4 | 36.2 | 38.9 |
| 1924..... | 36.6 | 37.5 | 38.2 | 38.4 | 37.4 | 36.0 | 34.3 | 33.5 | 35.5 | 37.3 | 40.1 | 42.2 | 36.9 |
| 1925..... | 42.8 | 43.2 | 43.0 | 40.8 | 36.9 | 35.7 | 39.4 | 38.1 | 37.8 | 37.2 | 37.8 | 39.5 | 38.5 |
| 1926..... | 38.9 | 37.7 | 34.7 | 33.2 | 32.0 | 31.4 | 31.9 | 31.9 | 32.6 | 31.6 | 31.6 | 30.1 | 32.5 |
| 1927..... | 30.9 | 31.1 | 31.3 | 30.4 | 30.1 | 30.2 | 30.7 | 31.2 | 31.2 | 30.9 | 31.1 | 32.0 | 30.7 |
| 1928..... | 33.2 | 34.4 | 35.4 | 35.6 | 37.0 | 38.7 | 37.6 | 37.0 | 36.5 | 36.0 | 35.9 | 35.6 | 36.7 |
| 1929..... | 35.9 | 35.9 | 35.5 | 33.8 | 31.3 | 30.2 | 29.4 | 29.2 | 29.0 | 28.6 | 28.5 | 27.8 | 30.9 |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by number of sheep Jan. 1, by States; yearly price obtained by using estimates of the division of crop and livestock estimates and the division of statistical and historical research.

TABLE 419.—*Wool, scoured basis, territory, grades 64s, 70s, 80s (fine strictly combing): Average price per pound, Boston market, 1900–1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1900..... | 64 | 64 | 61 | 59 | 58 | 58 | 54 | 52 | 51 | 51 | 50 | 50 | 56 |
| 1901..... | 50 | 49 | 46 | 46 | 46 | 46 | 46 | 46 | 46 | 46 | 46 | 48 | 47 |
| 1902..... | 48 | 49 | 50 | 50 | 50 | 50 | 50 | 50 | 52 | 52 | 52 | 55 | 51 |
| 1903..... | 56 | 56 | 56 | 56 | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 55 |
| 1904..... | 54 | 54 | 52 | 52 | 54 | 57 | 58 | 60 | 64 | 65 | 68 | 69 | 59 |
| 1905..... | 69 | 69 | 68 | 69 | 72 | 73 | 74 | 74 | 74 | 74 | 74 | 74 | 72 |
| 1906..... | 74 | 72 | 72 | 72 | 72 | 72 | 70 | 70 | 70 | 70 | 70 | 70 | 71 |
| 1907..... | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 72 | 72 | 72 | 70 | 69 | 70 |
| 1908..... | 68 | 66 | 64 | 62 | 54 | 56 | 56 | 57 | 57 | 58 | 60 | 62 | 60 |
| 1909..... | 63 | 64 | 64 | 65 | 66 | 70 | 74 | 76 | 76 | 76 | 76 | 75 | 70 |
| 1910..... | 74 | 73 | 71 | 68 | 63 | 61 | 61 | 62 | 62 | 63 | 63 | 63 | 65 |
| 1911..... | 61 | 59 | 54 | 53 | 52 | 52 | 55 | 56 | 59 | 60 | 61 | 61 | 57 |
| 1912..... | 61 | 61 | 61 | 61 | 61 | 61 | 63 | 68 | 68 | 68 | 67 | 67 | 64 |
| 1913..... | 66 | 64 | 59 | 56 | 55 | 54 | 54 | 54 | 53 | 53 | 53 | 52 | 56 |
| 1914..... | 52 | 56 | 57 | 59 | 60 | 61 | 61 | 63 | 61 | 59 | 61 | 61 | 59 |
| 1915..... | 63 | 73 | 73 | 71 | 69 | 71 | 71 | 71 | 71 | 71 | 71 | 73 | 71 |
| 1916..... | 74 | 77 | 77 | 79 | 79 | 81 | 82 | 85 | 89 | 89 | 97 | 105 | 84 |
| 1917..... | 113 | 123 | 128 | 133 | 138 | 174 | 174 | 178 | 181 | 180 | 180 | 180 | 157 |
| 1918..... | 180 | 180 | 183 | 185 | 180 | 180 | 185 | 180 | 180 | 185 | 180 | 180 | 182 |
| 1919..... | 160 | 152 | 158 | 165 | 165 | 175 | 185 | 185 | 185 | 200 | 200 | 200 | 178 |
| 1920 ¹ | 200 | 205 | 205 | 200 | 200 | 175 | 160 | 145 | 130 | 120 | 95 | 90 | 160 |
| 1921..... | 84 | 90 | 89 | 88 | 86 | 82 | 82 | 82 | 82 | 82 | 84 | 88 | 85 |
| 1922..... | 97 | 110 | 110 | 109 | 127 | 134 | 135 | 131 | 130 | 134 | 139 | 140 | 125 |
| 1923..... | 143 | 144 | 144 | 149 | 153 | 150 | 144 | 137 | 132 | 130 | 130 | 134 | 141 |
| 1924..... | 139 | 139 | 142 | 138 | 135 | 129 | 130 | 137 | 142 | 147 | 154 | 164 | 141 |
| 1925..... | 168 | 164 | 153 | 138 | 126 | 130 | 137 | 132 | 129 | 128 | 131 | 131 | 139 |
| 1926..... | 127 | 124 | 118 | 116 | 112 | 110 | 116 | 116 | 116 | 116 | 114 | 110 | 116 |
| 1927..... | 110 | 110 | 110 | 109 | 108 | 108 | 111 | 111 | 111 | 112 | 112 | 112 | 110 |
| 1928..... | 116 | 116 | 116 | 117 | 119 | 120 | 120 | 115 | 112 | 112 | 113 | 114 | 116 |
| 1929..... | 114 | 111 | 108 | 104 | 100 | 97 | 94 | 94 | 93 | 90 | 88 | 84 | 98 |

Bureau of Agricultural Economics. 1900–1920 prices from quarterly reports of the National Association of Wool Manufacturers. 1921–1923 average of weekly range quotations from the Boston Commercial Bulletin and 1924–1929 from the livestock and meat reporting service of the bureau.

¹ Prices June–December, 1920, largely nominal.

TABLE 420.—*Wool, scoured basis, territory, grade 56s (¾-blood strictly combing): Average price per pound, Boston market, 1900–1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1900..... | 54 | 54 | 52 | 49 | 48 | 46 | 46 | 45 | 44 | 43 | 43 | 42 | 47 |
| 1901..... | 42 | 41 | 39 | 39 | 38 | 36 | 36 | 37 | 38 | 38 | 39 | 39 | 39 |
| 1902..... | 39 | 39 | 39 | 39 | 39 | 41 | 41 | 41 | 42 | 42 | 42 | 43 | 41 |
| 1903..... | 43 | 43 | 43 | 43 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 43 |
| 1904..... | 44 | 45 | 45 | 45 | 45 | 50 | 50 | 52 | 52 | 54 | 56 | 59 | 50 |
| 1905..... | 59 | 59 | 58 | 58 | 62 | 64 | 66 | 67 | 68 | 68 | 66 | 66 | 63 |
| 1906..... | 65 | 64 | 64 | 64 | 64 | 64 | 64 | 62 | 62 | 62 | 62 | 62 | 63 |
| 1907..... | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 56 | 54 | 60 |
| 1908..... | 51 | 48 | 46 | 44 | 42 | 42 | 42 | 42 | 42 | 44 | 47 | 50 | 45 |
| 1909..... | 52 | 53 | 54 | 54 | 56 | 60 | 64 | 66 | 66 | 66 | 66 | 65 | 60 |
| 1910..... | 69 | 61 | 60 | 57 | 56 | 56 | 56 | 57 | 57 | 56 | 54 | 53 | 58 |
| 1911..... | 54 | 54 | 52 | 49 | 49 | 50 | 50 | 52 | 52 | 48 | 46 | 48 | 50 |
| 1912..... | 51 | 52 | 51 | 51 | 51 | 52 | 58 | 58 | 58 | 58 | 58 | 58 | 55 |
| 1913..... | 58 | 58 | 55 | 50 | 49 | 48 | 48 | 48 | 48 | 47 | 46 | 45 | 50 |
| 1914..... | 43 | 47 | 47 | 47 | 50 | 52 | 52 | 49 | 48 | 49 | 51 | 53 | 49 |
| 1915..... | 56 | 63 | 66 | 66 | 66 | 66 | 66 | 68 | 68 | 68 | 67 | 69 | 66 |
| 1916..... | 70 | 71 | 71 | 71 | 72 | 74 | 76 | 78 | 79 | 80 | 87 | 90 | 77 |
| 1917..... | 91 | 100 | 102 | 110 | 118 | 132 | 132 | 138 | 146 | 148 | 148 | 148 | 126 |
| 1918..... | 148 | 149 | 152 | 152 | 142 | 142 | (1) | (1) | (1) | (1) | (1) | (1) | ----- |
| 1919..... | 126 | 121 | 121 | 110 | 118 | 120 | 128 | 137 | 138 | 127 | 130 | 135 | 126 |
| 1920..... | 135 | 135 | 131 | 130 | 125 | 112 | 99 | 95 | 88 | 74 | 65 | 56 | 104 |
| 1921..... | 53 | 55 | 55 | 54 | 58 | 50 | 51 | 52 | 52 | 52 | 54 | 58 | 53 |
| 1922..... | 63 | 76 | 77 | 74 | 83 | 88 | 88 | 90 | 92 | 95 | 99 | 98 | 85 |
| 1923..... | 100 | 103 | 105 | 107 | 111 | 111 | 109 | 105 | 103 | 101 | 104 | 108 | 106 |
| 1924..... | 113 | 116 | 116 | 113 | 109 | 97 | 100 | 109 | 113 | 117 | 122 | 133 | 113 |
| 1925..... | 136 | 136 | 125 | 109 | 96 | 99 | 105 | 101 | 102 | 102 | 108 | 109 | 111 |
| 1926..... | 103 | 99 | 93 | 91 | 89 | 89 | 90 | 90 | 91 | 93 | 93 | 91 | 92 |
| 1927..... | 90 | 90 | 90 | 90 | 88 | 88 | 90 | 91 | 91 | 94 | 94 | 94 | 91 |
| 1928..... | 97 | 99 | 100 | 106 | 107 | 108 | 107 | 103 | 104 | 104 | 104 | 104 | 104 |
| 1929..... | 104 | 104 | 101 | 95 | 89 | 88 | 88 | 90 | 90 | 89 | 87 | 82 | 92 |

¹ No quotations.

TABLE 421.—Wool, grease basis, Ohio and similar, grade 58s (¾-blood strictly combing): Average price per pound, Boston market, 1900-1929

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1900..... | 29 | 28 | 27 | 27 | 26 | 25 | 25 | 24 | 24 | 24 | 23 | 24 | 26 |
| 1901..... | 24 | 23 | 23 | 23 | 22 | 20 | 20 | 20 | 21 | 21 | 21 | 22 | 22 |
| 1902..... | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 23 | 24 | 22 |
| 1903..... | 25 | 25 | 25 | 23 | 23 | 24 | 24 | 24 | 26 | 26 | 26 | 26 | 25 |
| 1904..... | 25 | 20 | 26 | 26 | 26 | 28 | 28 | 28 | 29 | 29 | 31 | 32 | 28 |
| 1905..... | 32 | 31 | 30 | 31 | 35 | 36 | 36 | 35 | 35 | 35 | 35 | 34 | 34 |
| 1906..... | 34 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 34 | 34 | 34 | 33 |
| 1907..... | 34 | 34 | 34 | 33 | 32 | 32 | 33 | 33 | 33 | 33 | 31 | 30 | 33 |
| 1908..... | 31 | 31 | 30 | 29 | 25 | 26 | 25 | 25 | 26 | 26 | 27 | 28 | 27 |
| 1909..... | 29 | 30 | 31 | 33 | 34 | 35 | 36 | 36 | 37 | 37 | 37 | 37 | 34 |
| 1910..... | 36 | 36 | 36 | 34 | 31 | 28 | 28 | 28 | 28 | 29 | 30 | 30 | 31 |
| 1911..... | 30 | 29 | 28 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 26 |
| 1912..... | 27 | 30 | 29 | 28 | 27 | 20 | 30 | 30 | 30 | 30 | 30 | 30 | 29 |
| 1913..... | 31 | 31 | 30 | 26 | 24 | 24 | 24 | 24 | 24 | 24 | 23 | 24 | 26 |
| 1914..... | 24 | 24 | 24 | 25 | 26 | 28 | 28 | 28 | 28 | 28 | 29 | 30 | 27 |
| 1915..... | 31 | 35 | 37 | 37 | 36 | 36 | 38 | 38 | 37 | 36 | 37 | 38 | 36 |
| 1916..... | 38 | 40 | 40 | 40 | 40 | 41 | 42 | 42 | 42 | 43 | 45 | 48 | 42 |
| 1917..... | 49 | 54 | 56 | 59 | 63 | 70 | 74 | 75 | 76 | 76 | 77 | 77 | 67 |
| 1918..... | 78 | 77 | 78 | 78 | 76 | 76 | (1) | (1) | (1) | (1) | (1) | (1) | --- |
| 1919..... | 70 | 65 | 65 | 61 | 61 | 63 | 70 | 71 | 70 | 68 | 69 | 70 | 67 |
| 1920..... | 70 | 70 | 70 | 69 | 68 | 57 | 52 | 49 | 45 | 40 | 37 | 30 | 55 |
| 1921..... | 29 | 30 | 30 | 30 | 29 | 26 | 26 | 26 | 26 | 26 | 28 | 32 | 28 |
| 1922..... | 36 | 39 | 40 | 38 | 42 | 47 | 46 | 46 | 47 | 49 | 53 | 54 | 45 |
| 1923..... | 55 | 56 | 56 | 56 | 56 | 57 | 56 | 54 | 53 | 52 | 53 | 54 | 55 |
| 1924..... | 55 | 56 | 57 | 55 | 53 | 49 | 48 | 53 | 55 | 59 | 63 | 69 | 56 |
| 1925..... | 70 | 69 | 66 | 55 | 46 | 49 | 53 | 52 | 50 | 52 | 54 | 54 | 56 |
| 1926..... | 54 | 53 | 49 | 46 | 44 | 43 | 44 | 44 | 44 | 45 | 46 | 45 | 46 |
| 1927..... | 45 | 45 | 45 | 44 | 42 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 45 |
| 1928..... | 50 | 52 | 52 | 53 | 55 | 57 | 56 | 55 | 55 | 55 | 56 | 56 | 54 |
| 1929..... | 56 | 55 | 54 | 50 | 45 | 44 | 45 | 45 | 45 | 45 | 44 | 42 | 48 |

Bureau of Agricultural Economics. 1900-1909 from quarterly reports of the National Association of Wool Manufacturers on Ohio, Pennsylvania, and West Virginia ¾-blood, 1910-1923 from Boston Cottonier's annual Bulletin, average of weekly range on Ohio and Pennsylvania ¾-blood, and 1924-1929 from the livestock and meat reporting service of the Bureau.

¹ No quotations.

TABLE 422.—Wool, grades 6½s-70s: Average price per pound at London, scoured basis, 1921-1929

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1921..... | 78.65 | 71.02 | 63.40 | 54.00 | 60.00 | 61.70 | 52.50 | 57.10 | 61.70 | 75.10 | 73.15 | 75.00 | 65.28 |
| 1922..... | 82.00 | 84.30 | 84.60 | 90.00 | 95.40 | 94.55 | 96.00 | 102.00 | 101.60 | 107.30 | 108.95 | 106.30 | 96.08 |
| 1923..... | 112.40 | 107.00 | 107.70 | 106.40 | 115.50 | 110.70 | 111.00 | 111.30 | 111.60 | 112.50 | 112.60 | 113.70 | 111.03 |
| 1924..... | 117.90 | 121.80 | 121.60 | 122.00 | 123.15 | 122.68 | 122.20 | 130.75 | 139.30 | 138.00 | 148.40 | 150.30 | 129.84 |
| 1925..... | 140.10 | 130.00 | 119.70 | 115.95 | 112.20 | 112.60 | 113.00 | 110.00 | 107.00 | 108.90 | 111.00 | 101.00 | 115.12 |
| 1926..... | 97.30 | 97.30 | 97.30 | 98.10 | 97.70 | 97.30 | 94.30 | 94.80 | 95.30 | 93.30 | 92.75 | 90.75 | 95.51 |
| 1927..... | 89.20 | 94.00 | 95.30 | 94.30 | 95.30 | 95.80 | 96.30 | 96.85 | 97.40 | 98.40 | 99.40 | 99.40 | 95.97 |
| 1928..... | 101.40 | 102.00 | 103.40 | 102.40 | 101.40 | 101.40 | 101.40 | 98.35 | 95.30 | 90.00 | 93.30 | 91.20 | 98.46 |
| 1929..... | 91.20 | 90.00 | 85.20 | 83.00 | 79.00 | 76.25 | 73.50 | 70.00 | 66.91 | 64.88 | 63.87 | 62.86 | 75.55 |

Bureau of Agricultural Economics. These data were obtained from prices given by Kreglinger and Fernau for the opening and closing of each series of the London wool sales. For months when no sales were held the figures are interpolations of nearest actual prices. Conversions at monthly average rate of exchange as given in Federal Reserve Bulletins to December, 1925, inclusive; subsequently at par.

TABLE 423.—Wool, grade 58s: Average price per pound at London, scoured basis, 1921-1929

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1921..... | 43.60 | 45.40 | 38.00 | 36.00 | 40.00 | 36.40 | 31.60 | 35.05 | 38.50 | 39.00 | 36.70 | 39.30 | 38.30 |
| 1922..... | 45.90 | 46.00 | 47.00 | 50.35 | 53.70 | 48.20 | 50.20 | 51.00 | 55.40 | 66.60 | 68.30 | 69.60 | 54.35 |
| 1923..... | 73.00 | 71.90 | 73.45 | 80.00 | 80.90 | 77.00 | 76.60 | 77.10 | 77.60 | 77.60 | 76.20 | 80.00 | 76.78 |
| 1924..... | 80.90 | 84.20 | 85.00 | 83.75 | 82.50 | 82.00 | 81.50 | 87.15 | 92.80 | 101.00 | 105.00 | 111.30 | 89.76 |
| 1925..... | 105.00 | 90.80 | 89.00 | 80.90 | 72.80 | 73.85 | 74.90 | 70.75 | 66.60 | 66.60 | 66.60 | 66.60 | 77.03 |
| 1926..... | 60.80 | 60.80 | 60.80 | 59.80 | 58.30 | 56.80 | 58.80 | 59.80 | 60.80 | 59.80 | 57.00 | 58.80 | 59.36 |
| 1927..... | 58.80 | 68.00 | 71.00 | 66.00 | 66.90 | 67.40 | 67.90 | 68.40 | 68.90 | 70.95 | 73.00 | 75.00 | 68.52 |
| 1928..... | 77.00 | 80.00 | 81.10 | 79.55 | 78.00 | 77.50 | 77.00 | 74.00 | 71.00 | 70.00 | 73.00 | 74.00 | 76.01 |
| 1929..... | 75.00 | 69.95 | 63.90 | 61.80 | 58.80 | 56.75 | 54.70 | 52.70 | 50.69 | 46.64 | 50.69 | 50.69 | 57.69 |

Bureau of Agricultural Economics. These data were obtained from the prices given by Kreglinger and Fernau for the opening and closing of each series of the London wool sales. For months when no sales were held the figures are interpolations of nearest actual prices. Conversions at monthly average rate of exchange as given in Federal Reserve Bulletins to December, 1925, inclusive; subsequently at par.

TABLE 424.—Goats and mohair: Estimates ¹ of goats clipped, mohair clipped, and average clip per goat (principal producing States), 1920-1928

GOATS CLIPPED

| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> |
| Texas..... | 1,834 | 1,984 | 1,750 | 1,797 | 2,008 | 1,857 | 2,367 | 2,579 | 2,800 |
| New Mexico..... | 124 | 128 | 110 | 110 | 127 | 120 | 135 | 165 | 170 |
| Arizona..... | 145 | 145 | 152 | 160 | 165 | 162 | 165 | 185 | 185 |
| California..... | 72 | 74 | 59 | 57 | 57 | 58 | 56 | 52 | 45 |
| Oregon..... | 113 | 115 | 105 | 103 | 101 | 110 | 115 | 115 | 125 |
| Missouri..... | 58 | 60 | 55 | 53 | 60 | 67 | 61 | 63 | 66 |
| Total..... | 2,346 | 2,506 | 2,231 | 2,280 | 2,518 | 2,374 | 2,899 | 3,159 | 3,391 |

MOHAIR (INCLUDING KID HAIR) PRODUCED

| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
|-----------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Texas..... | 6,786 | 7,607 | 6,838 | 7,352 | 7,996 | 8,519 | 9,887 | 11,312 | 12,330 |
| New Mexico..... | 397 | 422 | 352 | 374 | 457 | 444 | 473 | 611 | 629 |
| Arizona..... | 464 | 479 | 517 | 560 | 611 | 599 | 578 | 685 | 684 |
| California..... | 230 | 244 | 207 | 211 | 217 | 220 | 207 | 203 | 176 |
| Oregon..... | 452 | 460 | 431 | 422 | 414 | 462 | 483 | 483 | 525 |
| Missouri..... | 145 | 150 | 143 | 148 | 162 | 188 | 171 | 176 | 178 |
| Total..... | 8,474 | 9,362 | 8,488 | 9,067 | 9,857 | 10,432 | 11,799 | 13,470 | 14,522 |

AVERAGE CLIP PER GOAT CLIPPED ¹

| | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> |
|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Texas..... | 3.7 | 3.8 | 3.9 | 4.1 | 4.0 | 4.6 | 4.2 | 4.4 | 4.4 |
| New Mexico..... | 3.2 | 3.3 | 3.2 | 3.4 | 3.6 | 3.7 | 3.5 | 3.7 | 3.7 |
| Arizona..... | 3.2 | 3.3 | 3.4 | 3.5 | 3.7 | 3.7 | 3.5 | 3.7 | 3.7 |
| California..... | 3.2 | 3.3 | 3.5 | 3.7 | 3.8 | 3.8 | 3.7 | 3.9 | 3.9 |
| Oregon..... | 4.0 | 4.0 | 4.1 | 4.1 | 4.1 | 4.2 | 4.2 | 4.2 | 4.2 |
| Missouri..... | 2.5 | 2.5 | 2.6 | 2.8 | 2.7 | 2.8 | 2.8 | 2.8 | 2.7 |
| Average, 6 States..... | 3.6 | 3.7 | 3.8 | 4.0 | 3.9 | 4.4 | 4.1 | 4.3 | 4.3 |

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¹ Figures for 1923, 1924, and 1925 are revisions of department's estimates previously published.

² Most goats clipped twice a year. In Texas, kids are clipped in the fall of year of birth. Figures include both goats and kids clipped.

³ In States where goats are clipped twice a year figures include both spring and fall clip.

TABLE 425.—*Livestock: Number of animals slaughtered at Federal-inspected plants and number of whole carcasses condemned,¹ 1907-1929*

| Year ended June 30— | Cattle | | Calves | | Sheep | | Goats | | Swine | | Horses | | Total slaughter |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------------|
| | Slaughter | Condemned | Slaughter | Condemned | Slaughter | Condemned | Slaughter | Condemned | Slaughter | Condemned | Slaughter | Condemned | |
| | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands | Thousands |
| 1907 | 7,622 | 27.9 | 1,764 | 6.4 | 9,682 | 9.5 | 52 | 0.0 | 31,816 | 105.9 | | | 50,835 |
| 1908 | 7,116 | 33.2 | 1,995 | 5.0 | 9,703 | 8.1 | 46 | 0.0 | 35,113 | 127.9 | | | 53,973 |
| 1909 | 7,325 | 35.1 | 2,047 | 8.2 | 10,803 | 10.7 | 69 | 1.1 | 35,428 | 86.9 | | | 55,672 |
| 1910 | 7,062 | 42.4 | 2,295 | 7.5 | 11,150 | 11.1 | 116 | 2.2 | 27,656 | 52.4 | | | 49,179 |
| 1911 | 7,781 | 39.4 | 2,220 | 7.7 | 13,006 | 10.8 | 54 | 1.1 | 29,916 | 59.5 | | | 53,977 |
| 1912 | 7,532 | 50.4 | 2,243 | 8.0 | 14,209 | 15.4 | 64 | 1.1 | 34,966 | 129.0 | | | 59,014 |
| 1913 | 7,156 | 50.8 | 2,098 | 9.2 | 14,724 | 16.7 | 57 | 1.1 | 32,288 | 173.9 | | | 56,323 |
| 1914 | 6,724 | 48.4 | 1,815 | 6.7 | 14,950 | 20.6 | 122 | 7.7 | 33,290 | 204.9 | | | 56,909 |
| 1915 | 6,965 | 52.5 | 1,736 | 5.9 | 12,909 | 17.6 | 166 | 7.7 | 36,248 | 213.9 | | | 58,023 |
| 1916 | 7,404 | 57.6 | 2,048 | 6.7 | 11,986 | 15.1 | 180 | 7.7 | 40,483 | 195.1 | | | 62,101 |
| 1917 | 9,299 | 78.7 | 2,680 | 10.1 | 11,343 | 16.7 | 175 | 1.3 | 40,211 | 158.5 | | | 63,708 |
| 1918 | 10,938 | 68.2 | 3,323 | 8.1 | 8,769 | 12.6 | 150 | 4.4 | 36,449 | 113.1 | | | 68,630 |
| 1919 | 11,242 | 59.5 | 3,674 | 9.2 | 11,268 | 14.4 | 126 | 3.4 | 44,398 | 128.8 | | | 70,709 |
| 1920 | 9,710 | 58.6 | 4,228 | 13.8 | 12,335 | 20.0 | 77 | 1.1 | 38,982 | 133.5 | 1 | 0.1 | 66,332 |
| 1921 | 8,180 | 46.9 | 3,896 | 7.7 | 12,452 | 12.7 | 20 | 0.0 | 37,703 | 122.6 | | 0 | 62,262 |
| 1922 | 7,871 | 55.2 | 3,924 | 11.4 | 11,968 | 10.5 | 14 | 0.0 | 39,416 | 160.1 | 2 | 0 | 63,196 |
| 1923 | 9,030 | 73.3 | 4,338 | 11.8 | 11,404 | 13.3 | 25 | 1.1 | 48,600 | 196.3 | 1 | 0 | 73,398 |
| 1924 | 9,189 | 83.9 | 4,668 | 12.7 | 11,505 | 12.9 | 31 | 3.3 | 54,416 | 232.7 | 5 | 0 | 79,814 |
| 1925 | 9,774 | 92.1 | 5,185 | 11.1 | 12,203 | 12.7 | 27 | 1.1 | 48,460 | 180.4 | 12 | 0 | 75,660 |
| 1926 | 10,098 | 103.6 | 5,312 | 11.9 | 12,354 | 14.5 | 43 | 1.1 | 40,443 | 143.0 | 40 | 1 | 68,289 |
| 1927 | 10,050 | 83.5 | 5,080 | 10.6 | 12,894 | 16.4 | 30 | 1.1 | 42,650 | 173.6 | 43 | 2 | 70,747 |
| 1928 | 9,040 | 60.4 | 4,774 | 9.0 | 12,984 | 15.4 | 20 | 1.1 | 48,347 | 154.2 | 107 | 3 | 75,737 |
| 1929 | 8,284 | 61.9 | 4,526 | 8.9 | 13,760 | 20.1 | 21 | 1.1 | 47,164 | 139.4 | 117 | 4 | 73,881 |

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¹ The numbers of condemned carcasses are expressed in thousands and tenths; that is, the last figure represents hundreds.

NOTE.—Tables similar to Tables 429 and 430, 1928 Yearbook consumption of meats, are omitted.

TABLE 426.—*Meat and meat products prepared under Federal inspection, 1907-1929*

| Year ended June 30— | Pork placed in cure | Sausage chopped | Canned meats | Lard | Lard compounds and substitutes | Oleo products | Oleo-margarine | All other products | Total |
|---------------------|---------------------|-----------------|--------------|--------------|--------------------------------|---------------|----------------|--------------------|--------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1907 | 2,248,886 | 267,760 | 105,196 | 1,003,602 | 353,549 | 283,971 | 55,694 | 145,554 | 4,464,213 |
| 1908 | 2,875,997 | 416,200 | 92,582 | 1,433,778 | 436,448 | 293,425 | 79,380 | 330,487 | 5,958,298 |
| 1909 | 2,686,051 | 457,095 | 123,810 | 1,308,986 | 488,249 | 295,889 | 91,068 | 1,340,289 | 6,791,437 |
| 1910 | 2,216,680 | 485,984 | 127,263 | 948,468 | 671,526 | 296,429 | 139,158 | 1,338,576 | 6,223,964 |
| 1911 | 2,568,149 | 488,814 | 144,942 | 1,185,503 | 872,945 | 330,688 | 117,848 | 1,425,444 | 6,934,233 |
| 1912 | 2,633,752 | 523,893 | 153,871 | 1,309,140 | 648,443 | 297,038 | 128,319 | 1,585,103 | 7,279,559 |
| 1913 | 2,545,358 | 531,626 | 115,237 | 1,222,857 | 670,802 | 264,705 | 145,356 | 1,598,869 | 7,094,810 |
| 1914 | 2,568,335 | 542,017 | 120,473 | 1,187,963 | 590,409 | 274,625 | 143,999 | 1,605,475 | 7,033,296 |
| 1915 | 2,913,328 | 502,675 | 235,963 | 1,277,734 | 520,899 | 273,049 | 145,931 | 1,663,491 | 7,533,070 |
| 1916 | 2,922,381 | 565,047 | 164,200 | 1,277,870 | 397,089 | 287,047 | 152,388 | 1,708,972 | 7,474,994 |
| 1917 | 2,918,211 | 635,860 | 283,319 | 1,119,315 | 466,198 | 279,197 | 225,074 | 1,736,459 | 7,663,633 |
| 1918 | 3,132,549 | 624,827 | 468,633 | 943,861 | 453,164 | 263,630 | 265,335 | 1,743,196 | 7,905,185 |
| 1919 | 3,717,838 | 667,602 | 632,259 | 1,256,043 | 469,732 | 266,808 | 251,170 | 1,907,590 | 9,169,042 |
| 1920 | 2,903,854 | 682,521 | 211,521 | 1,316,918 | 328,567 | 364,992 | 217,561 | 1,749,224 | 7,755,158 |
| 1921 | 2,501,885 | 583,777 | 86,240 | 1,487,820 | 339,366 | 253,397 | 151,638 | 1,723,697 | 7,127,620 |
| 1922 | 2,725,031 | 568,626 | 109,481 | 1,659,331 | 312,014 | 268,034 | 118,197 | 1,666,402 | 7,427,116 |
| 1923 | 3,366,258 | 679,315 | 160,132 | 2,017,939 | 336,843 | 278,137 | 129,767 | 1,920,156 | 8,888,547 |
| 1924 | 3,502,368 | 707,323 | 183,026 | 2,110,660 | 363,320 | 259,008 | 142,881 | 2,136,254 | 9,404,840 |
| 1925 | 3,176,714 | 736,877 | 214,330 | 1,783,933 | 458,518 | 287,271 | 133,836 | 2,170,598 | 8,912,077 |
| 1926 | 2,850,622 | 771,656 | 214,167 | 1,598,764 | 543,913 | 275,636 | 148,331 | 2,008,004 | 8,411,082 |
| 1927 | 2,920,206 | 765,074 | 248,459 | 1,691,344 | 535,175 | 280,641 | 148,384 | 1,977,161 | 8,566,444 |
| 1928 | 3,033,861 | 777,606 | 254,769 | 1,845,129 | 472,604 | 237,228 | 151,990 | 2,201,132 | 8,974,819 |
| 1929 | 2,992,898 | 785,463 | 281,743 | 1,817,601 | 467,077 | 228,531 | 158,881 | 2,214,503 | 8,946,697 |

Bureau of Animal Industry. The above figures do not represent production, as a product may be inspected more than once in course of further manufacture.

TABLE 427.—*Meat and meat products*, *annual 1925-1928*, *average 1911-1913*,

| Country | Year ended Dec. 31 | | | | | | | |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Average 1911-1913 | | 1926 | | 1927 | | 1928 preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Argentina..... | 3,487 | 1,173,461 | 424 | 2,087,359 | 477 | 2,280,405 | 1,745,009 | 1,745,009 |
| Australia..... | 1,967 | 507,143 | 15,506 | 1,422,134 | 15,349 | 1,321,643 | 18,332 | 1,310,436 |
| Brazil..... | 54,012 | 1,520 | 9,372 | 30,033 | 3,103 | 90,872 | 169,013 | 169,013 |
| Canada..... | 43,327 | 60,242 | 25,247 | 157,473 | 18,287 | 159,297 | 26,462 | 114,864 |
| Chile..... | 11,738 | 19,728 | 6,147 | 32,650 | — | 36,898 | — | 43,564 |
| China..... | 85 | 64,084 | 4,560 | 53,844 | 3,040 | 47,348 | 4,385 | 44,153 |
| Denmark..... | 32,184 | 308,188 | 24,642 | 551,033 | 33,205 | 628,919 | 16,045 | 700,488 |
| Hungary..... | 0 | 0 | 6,140 | 62,623 | 9,476 | 25,768 | 10,817 | 14,861 |
| Irish Free State..... | 0 | 0 | 73,891 | 88,199 | 66,667 | 105,423 | 57,194 | 135,551 |
| Netherlands..... | 359,864 | 497,402 | 224,127 | 495,723 | 210,180 | 608,075 | 180,100 | 538,807 |
| New Zealand..... | 990 | 326,539 | 1,064 | 398,502 | 943 | 441,127 | 1,062 | 436,639 |
| Rumania..... | 321 | 3,546 | 1,606 | 41,241 | — | — | — | — |
| Sweden..... | 24,215 | 39,798 | 38,000 | 40,333 | 31,635 | 73,202 | 28,917 | 65,576 |
| Union of South Africa..... | 31,103 | 10,786 | 37,122 | 18,040 | 15,253 | 16,313 | 18,580 | 18,580 |
| United States..... | 18,719 | 1,277,524 | 102,626 | 1,445,219 | 161,302 | 1,290,979 | 193,993 | 1,335,782 |
| Uruguay..... | 702 | 196,911 | 0 | 447,200 | 0 | 428,056 | 0 | 333,930 |
| Yugoslavia..... | 0 | 0 | 6,937 | 37,524 | 9,670 | 23,731 | 10,494 | 21,205 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | |
| Austria..... | ¹ 49,268 | ¹ 12,420 | 120,383 | 8,245 | 118,728 | 7,721 | 127,709 | 11,400 |
| Belgium..... | 179,120 | 127,057 | 213,887 | 84,087 | 215,231 | 52,734 | 167,847 | 56,031 |
| British India..... | 14,775 | 2,024 | 17,641 | 1,230 | 12,482 | 1,114 | 11,158 | 1,390 |
| British Malaya..... | 9,703 | 0 | 14,420 | 2,295 | 15,266 | 2,266 | 16,549 | 2,536 |
| Cuba..... | 128,362 | 0 | 179,365 | 0 | 181,505 | 0 | — | — |
| Czechoslovakia..... | 0 | 0 | 113,617 | 9,358 | 94,459 | 10,054 | 85,941 | 10,569 |
| Egypt..... | 4,689 | 0 | 6,651 | 115 | 6,246 | 110 | 7,737 | 108 |
| Finland..... | 14,973 | 2,081 | 20,021 | 7,728 | 19,917 | 3,905 | 19,588 | 1,646 |
| France..... | 111,496 | 98,281 | 310,163 | 47,366 | 402,140 | 58,250 | 218,892 | 77,882 |
| Germany..... | 559,732 | 19,525 | 937,666 | 34,937 | 899,275 | 37,320 | 703,255 | 48,022 |
| Italy..... | 104,619 | 15,708 | 205,120 | 35,575 | 198,584 | 18,369 | 215,357 | 13,027 |
| Japan..... | 11,727 | 0 | 74,779 | 0 | 74,539 | 0 | 67,883 | 369 |
| Norway..... | 42,416 | 3,365 | 38,685 | 3,096 | 29,542 | 2,644 | 28,617 | 2,715 |
| Peru..... | 7,859 | 110 | 15,873 | 230 | 12,924 | 155 | — | 1,200 |
| Philippine Islands..... | 21,902 | 0 | 19,574 | 0 | 20,578 | 0 | 19,767 | 0 |
| Poland..... | 0 | 0 | 22,857 | 79,412 | 48,872 | 63,266 | 68,364 | 64,673 |
| Spain..... | 37,974 | 3,200 | 26,332 | 70,952 | 23,949 | — | — | — |
| Switzerland..... | 60,174 | 3,169 | 30,010 | 3,208 | 31,242 | 3,218 | 30,850 | 3,335 |
| United Kingdom..... | 2,843,005 | 117,226 | 3,839,985 | 126,400 | 3,854,368 | 148,826 | 3,814,659 | 50,803 |
| Total..... | 4,785,098 | 4,941,226 | 6,748,203 | 6,948,446 | 6,837,224 | 7,040,908 | 6,158,296 | 6,394,133 |
| Totals by kinds of meat: | | | | | | | | |
| Beef..... | 2,023,704 | 2,161,464 | 3,146,747 | 3,188,028 | 3,104,568 | 3,210,056 | 2,623,058 | 2,371,528 |
| Mutton..... | 610,820 | 559,795 | 659,902 | 581,958 | 692,705 | 662,307 | 688,828 | 586,272 |
| Pork..... | 1,585,242 | 1,604,439 | 2,203,740 | 2,199,028 | 2,267,140 | 2,297,466 | 2,109,017 | 2,370,816 |
| Other..... | 565,332 | 615,528 | 737,804 | 970,432 | 772,811 | 871,079 | 737,393 | 1,065,517 |
| Total..... | 4,785,098 | 4,941,226 | 6,748,203 | 6,948,446 | 6,837,224 | 7,040,908 | 6,158,296 | 6,394,133 |

Bureau of Agricultural Economics. Official sources.

¹ Year ended June 30.² One year only.³ Average for Austria-Hungary.

TABLE 428.—Meats, western dressed, fresh and smoked: Average wholesale price per 100 pounds at Chicago and New York, by months, July, 1928, to December,

BEEF AND VEAL

| Year and month | Chicago | | | | | | | New York | | | | | | |
|-------------------|---------------|-------------------|---------------|-------------------|----------------------|----------------|----------------------------|---------------|-------------------|--------|--------|----------------------|----------------|----------------------------|
| | Steer beef | | | | | Cow beef, good | Vealers, ¹ good | Steer beef | | | | | Cow beef, good | Vealers, ¹ good |
| | Choice | | Good | | Medium 500 pounds up | | | Choice | | Good | | Medium 500 pounds up | | |
| | 700 pounds up | 550 to 700 pounds | 700 pounds up | 550 to 700 pounds | | | | 700 pounds up | 550 to 700 pounds | | | | | |
| | | | | | | | | | | | | | | |
| 1928 | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| July | 23.22 | 23.71 | 22.21 | 22.67 | 20.74 | 18.85 | 22.84 | 23.50 | 23.74 | 22.71 | 22.84 | 20.03 | 19.39 | 22.42 |
| August | 23.48 | 24.33 | 22.48 | 23.13 | 20.50 | 18.50 | 25.48 | 25.41 | 25.94 | 24.41 | 24.34 | 20.46 | 19.85 | 26.00 |
| September | 25.01 | 25.90 | 24.09 | 24.48 | 21.24 | 18.62 | 26.68 | 26.99 | 27.39 | 25.26 | 25.14 | 20.65 | 19.66 | 26.80 |
| October | 24.53 | 25.30 | 23.06 | 23.30 | 18.91 | 16.52 | 23.24 | 26.34 | 26.54 | 24.12 | 23.08 | 19.78 | 17.61 | 24.65 |
| November | 23.40 | 24.44 | 21.83 | 22.49 | 19.24 | 16.74 | 21.70 | 24.64 | 25.19 | 22.41 | 22.90 | 19.70 | 17.15 | 22.96 |
| December | 22.78 | 23.55 | 20.55 | 21.21 | 18.22 | 15.85 | 20.84 | 23.68 | 24.20 | 21.26 | 21.64 | 19.01 | 17.12 | 19.95 |
| Average, 6 months | 23.74 | 24.54 | 22.37 | 22.88 | 19.81 | 17.51 | 23.46 | 25.09 | 25.50 | 23.36 | 23.47 | 19.94 | 18.46 | 23.81 |
| 1929 | | | | | | | | | | | | | | |
| January | 22.17 | 23.11 | 20.18 | 20.96 | 18.34 | 17.08 | 24.01 | 22.02 | 22.91 | 20.17 | 20.79 | 18.70 | 17.49 | 26.10 |
| February | 19.01 | 20.26 | 18.31 | 18.48 | 16.99 | 10.06 | 23.38 | 20.64 | 20.96 | 18.94 | 19.09 | 17.54 | 16.61 | 23.70 |
| March | 20.28 | 21.19 | 19.18 | 19.90 | 18.60 | 16.86 | 23.52 | 20.96 | 21.42 | 19.62 | 19.94 | 18.46 | 17.36 | 23.50 |
| April | 20.75 | 21.55 | 19.75 | 20.51 | 19.09 | 17.89 | 20.65 | 22.35 | 22.70 | 21.56 | 21.68 | 20.30 | 19.05 | 21.68 |
| May | 21.70 | 22.70 | 21.20 | 21.92 | 20.67 | 19.49 | 22.92 | 22.65 | 22.97 | 21.92 | 22.21 | 20.67 | 19.87 | 21.26 |
| June | 22.25 | 23.22 | 21.50 | 22.48 | 21.25 | 19.70 | 23.65 | 23.48 | 23.66 | 22.76 | 22.94 | 21.55 | 20.55 | 24.68 |
| July | 23.54 | 24.07 | 22.54 | 23.01 | 21.54 | 19.08 | 24.05 | 24.94 | 24.99 | 24.07 | 24.00 | 21.22 | 20.79 | 26.04 |
| August | 23.48 | 23.75 | 22.74 | 22.79 | 19.40 | 17.56 | 24.72 | 24.88 | 25.12 | 23.28 | 23.28 | 19.94 | 17.75 | 26.09 |
| September | 23.05 | 23.45 | 21.80 | 22.26 | 18.45 | 16.87 | 24.24 | 24.64 | 24.72 | 22.77 | 22.77 | 18.72 | 16.98 | 26.52 |
| October | 22.44 | 23.36 | 21.21 | 21.78 | 17.69 | 16.02 | 21.51 | 23.81 | 23.85 | 21.40 | 21.40 | 17.57 | 16.20 | 23.44 |
| November | 21.95 | 22.40 | 20.25 | 20.34 | 17.65 | 15.24 | 20.29 | 22.30 | 22.38 | 20.36 | 20.14 | 17.16 | 15.76 | 22.98 |
| December | 21.68 | 23.01 | 19.86 | 20.71 | 17.79 | 15.56 | 21.38 | 22.80 | 22.90 | 20.98 | 20.98 | 19.10 | 16.85 | 23.24 |
| Average | 21.93 | 22.67 | 20.71 | 21.26 | 18.96 | 17.28 | 22.86 | 22.96 | 23.22 | 21.49 | 21.60 | 19.17 | 17.94 | 24.08 |

¹ Hide on.

TABLE 428.—Meats, western dressed, fresh and smoked: Average wholesale price per 100 pounds at Chicago and New York, by months, July, 1928, to December, 1929—Continued

| Year and month | Chicago | | | | | | New York | | | | | |
|------------------------|-----------------------|------------------------|--|--|---|-------------------------------|-----------------------|------------------------|--|--|---|-------------------------------|
| | Fresh pork | | | Cured pork and lard | | | Fresh pork | | | Cured pork and lard | | |
| | Hams, 10 to 14 pounds | Loins, 12 to 15 pounds | Shoulders, New York style, skinned, 8 to 12 pounds | Hams, smoked, regular No. 2, 14 to 16 pounds | Bacon, No. 1, smoked, dry cure, 8 to 8 pounds | Lard, refined (hardwood tubs) | Hams, 10 to 14 pounds | Loins, 12 to 15 pounds | Shoulders, New York style, skinned, 8 to 12 pounds | Hams, smoked, regular No. 2, 10 to 12 pounds | Bacon, No. 1, smoked, sweet-pickle cure, 8 to 10 pounds | Lard, refined (hardwood tubs) |
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1928 | | | | | | | | | | | | |
| August..... | 23.60 | 25.56 | 19.55 | 26.00 | 31.00 | 14.70 | 23.70 | 25.28 | 20.34 | 25.00 | 22.30 | 14.77 |
| September..... | 23.80 | 27.69 | 22.64 | 26.00 | 31.75 | 15.25 | 25.00 | 28.02 | 22.32 | 25.44 | 24.25 | 14.81 |
| October..... | 20.20 | 20.58 | 17.96 | 24.86 | 31.40 | 14.40 | 22.90 | 21.94 | 20.80 | 25.60 | 25.30 | 15.00 |
| November..... | 18.21 | 19.14 | 15.16 | 24.00 | 29.10 | 13.62 | 20.00 | 20.58 | 16.32 | 24.47 | 22.27 | 14.00 |
| December..... | 18.85 | 15.19 | 12.82 | 23.88 | 28.00 | 12.88 | 19.00 | 15.75 | 14.25 | 23.64 | 20.55 | 13.50 |
| Average, 5 months..... | 20.93 | 21.63 | 17.63 | 24.96 | 30.25 | 14.17 | 22.12 | 22.31 | 18.81 | 24.83 | 22.93 | 14.42 |
| 1929 | | | | | | | | | | | | |
| January..... | 19.76 | 17.40 | 14.07 | 23.50 | 28.00 | 12.75 | 21.00 | 17.13 | 15.02 | 22.44 | 19.20 | 13.65 |
| February..... | 20.42 | 18.18 | 14.71 | 23.38 | 28.38 | 12.75 | 21.50 | 18.46 | 16.34 | 21.58 | 19.22 | 13.62 |
| March..... | 21.78 | 23.38 | 17.35 | 23.50 | 29.25 | 13.31 | 24.50 | 23.25 | 18.59 | 22.88 | 20.82 | 14.00 |
| April..... | 22.90 | 22.41 | 17.04 | 24.25 | 30.38 | 13.25 | 25.25 | 22.25 | 18.65 | 23.25 | 21.00 | 13.50 |
| May..... | 21.64 | 22.20 | 16.37 | 24.16 | 30.16 | 12.85 | 24.05 | 22.18 | 17.84 | 23.45 | 21.20 | 13.50 |
| June..... | 23.00 | 20.44 | 15.66 | 24.62 | 30.52 | 12.85 | 24.25 | 21.05 | 17.78 | 24.81 | 22.70 | 13.50 |
| July..... | 23.68 | 22.09 | 17.28 | 26.14 | 31.96 | 13.22 | 25.00 | 23.32 | 18.80 | 27.25 | 24.00 | 13.50 |
| August..... | 23.05 | 24.32 | 17.68 | 26.25 | 32.12 | 13.56 | 25.50 | 25.01 | 19.70 | 27.18 | 24.00 | 14.25 |
| September..... | 23.05 | 24.31 | 17.34 | 25.08 | 31.75 | 13.81 | 24.25 | 25.80 | 19.40 | 25.32 | 24.75 | 14.25 |
| October..... | 20.22 | 22.86 | 16.20 | 23.95 | 31.42 | 13.17 | 21.98 | 23.30 | 17.89 | 23.98 | 24.14 | 13.80 |
| November..... | 17.60 | 18.30 | 14.86 | 22.68 | 29.23 | 12.21 | 20.88 | 20.22 | 16.70 | 22.38 | 23.50 | 13.75 |
| December..... | 18.40 | 18.10 | 14.30 | 21.65 | 28.80 | 11.94 | 19.25 | 17.90 | 15.91 | 22.00 | 22.00 | 13.08 |
| Average..... | 21.29 | 21.17 | 16.07 | 24.10 | 30.16 | 12.97 | 23.12 | 21.66 | 17.72 | 23.88 | 22.21 | 13.70 |

TABLE 428.—Meats, western dressed, fresh and smoked: Average wholesale price per 100 pounds at Chicago and New York, by months, July, 1928, to December, 1929—Continued

| Year and month | Chicago | | | | | | | New York | | | | | | |
|------------------------|----------------|-----------------|----------------|-----------------|------------------------|------------------------|------------------------------|----------------|-----------------|----------------|-----------------|------------------------|------------------------|------------------------------|
| | Lamb | | | | | | | Lamb | | | | | | |
| | Choice | | Good | | Medium, 38 pounds down | Common, 38 pounds down | Mutton, good, 70 pounds down | Choice | | Good | | Medium, 38 pounds down | Common, 38 pounds down | Mutton, good, 70 pounds down |
| | 38 pounds down | 39 to 45 pounds | 38 pounds down | 39 to 45 pounds | Medium, 38 pounds down | Common, 38 pounds down | Mutton, good, 70 pounds down | 38 pounds down | 39 to 45 pounds | 38 pounds down | 39 to 45 pounds | Medium, 38 pounds down | Common, 38 pounds down | Mutton, good, 70 pounds down |
| 1928 | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| July..... | 30.20 | 29.92 | 28.50 | 28.22 | 25.25 | 22.18 | 16.00 | 28.89 | 28.00 | 27.44 | 26.88 | 24.89 | 21.90 | 15.16 |
| August..... | 28.04 | 27.64 | 26.40 | 26.00 | 23.04 | 20.14 | 15.72 | 27.38 | 27.38 | 26.32 | 25.32 | 24.26 | 21.74 | 15.06 |
| September..... | 27.05 | 27.08 | 25.72 | 25.72 | 23.28 | 20.79 | 14.55 | 26.08 | 26.08 | 25.08 | 24.08 | 22.95 | 20.40 | 14.45 |
| October..... | 23.66 | 23.64 | 22.50 | 22.54 | 20.88 | 18.80 | 12.52 | 25.14 | 25.14 | 23.84 | 23.84 | 22.30 | 20.40 | 12.92 |
| November..... | 23.49 | 23.49 | 22.30 | 22.30 | 20.52 | 18.50 | 12.20 | 24.18 | 24.18 | 22.78 | 22.78 | 21.00 | 18.92 | 12.92 |
| December..... | 24.12 | 24.12 | 23.05 | 23.05 | 21.64 | 19.94 | 12.98 | 24.30 | 24.10 | 22.68 | 22.58 | 21.03 | 19.06 | 12.54 |
| Average, 6 months..... | 26.09 | 25.98 | 24.76 | 24.64 | 22.58 | 20.19 | 14.00 | 26.33 | 26.15 | 25.01 | 24.89 | 23.12 | 20.83 | 13.71 |
| 1929 | 29.11 | 29.07 | 28.12 | 28.08 | 27.10 | 25.82 | 10.48 | 30.42 | 29.66 | 29.29 | 28.59 | 27.70 | 25.84 | 16.40 |
| January..... | 28.35 | 28.08 | 27.30 | 27.02 | 26.30 | 25.30 | 15.40 | 30.14 | 29.26 | 29.01 | 28.26 | 27.71 | 26.41 | 15.48 |
| February..... | 30.02 | 29.65 | 29.02 | 28.65 | 27.55 | 26.25 | 18.80 | 30.75 | 29.65 | 29.55 | 28.65 | 28.10 | 26.65 | 20.00 |
| March..... | 30.15 | 29.80 | 29.00 | 28.75 | 27.90 | 26.65 | 31.48 | 30.48 | 30.45 | 29.45 | 28.95 | 27.45 | 25.30 | 14.30 |
| April..... | 29.85 | 29.38 | 28.65 | 28.24 | 26.70 | 24.86 | 16.64 | 30.90 | 29.42 | 29.51 | 28.36 | 27.22 | 25.58 | 14.14 |
| May..... | 29.62 | 29.15 | 28.50 | 27.88 | 25.48 | 22.65 | 13.85 | 29.42 | 28.30 | 27.95 | 26.68 | 25.65 | 23.00 | 13.80 |
| June..... | 29.18 | 29.13 | 28.08 | 27.88 | 25.36 | 21.59 | 14.18 | 30.34 | 29.88 | 29.10 | 28.64 | 26.56 | 24.14 | 14.89 |
| July..... | 27.60 | 27.60 | 26.48 | 26.48 | 24.05 | 20.80 | 13.30 | 26.90 | 26.55 | 25.12 | 24.95 | 22.52 | 20.15 | 12.79 |
| August..... | 25.38 | 25.38 | 24.38 | 24.38 | 22.00 | 18.85 | 11.45 | 26.08 | 25.92 | 24.12 | 23.98 | 21.56 | 20.00 | 11.55 |
| September..... | 23.80 | 23.78 | 22.40 | 22.18 | 20.74 | 18.80 | 11.64 | 25.00 | 24.22 | 23.92 | 23.00 | 22.45 | 20.86 | 11.23 |
| October..... | 24.20 | 23.95 | 22.75 | 22.75 | 21.20 | 19.40 | 12.40 | 25.44 | 24.50 | 24.38 | 23.53 | 23.41 | 21.11 | 12.80 |
| November..... | 25.52 | 24.35 | 24.20 | 23.35 | 22.05 | 19.90 | 12.56 | 26.00 | 25.20 | 25.00 | 24.20 | 23.62 | 22.12 | 12.39 |
| December..... | 27.73 | 27.44 | 26.57 | 26.30 | 24.70 | 22.57 | 14.78 | 28.58 | 27.75 | 27.29 | 26.52 | 25.47 | 23.61 | 14.65 |

Bureau of Agricultural Economics. Compiled from data of the livestock and meat-reporting service of the bureau. Earlier data in 1927 Yearbook, pp. 1050-1055 and in 1928 Yearbook, pp. 964-966.

TABLE 429.—Hides, packer: Average price per pound at Chicago, 1920-1929

| Year | Steers | | | | | Cows | | | Bulls | |
|----------------|--------------|-------------|-------------|--------------|------------|--------------|--------------|---------|--------|---------|
| | Heavy native | Heavy Texas | Light Texas | Butt branded | Colo-rados | Heavy native | Light native | Branded | Native | Branded |
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1920..... | 31.65 | 27.52 | 26.38 | 27.25 | 26.02 | 31.08 | 29.23 | 24.93 | 24.97 | 22.28 |
| 1921..... | 13.88 | 13.10 | 11.43 | 12.83 | 11.85 | 12.41 | 11.37 | 10.00 | 8.40 | 7.13 |
| 1922..... | 17.83 | 16.57 | 15.29 | 16.51 | 15.59 | 16.10 | 15.16 | 13.47 | 11.96 | 10.15 |
| 1923..... | 16.46 | 14.79 | 13.77 | 14.89 | 13.88 | 14.21 | 12.94 | 11.11 | 11.69 | 9.89 |
| 1924..... | 14.67 | 13.82 | 12.80 | 13.80 | 12.79 | 12.95 | 12.29 | 10.41 | 10.14 | 8.79 |
| 1925..... | 15.96 | 15.08 | 14.06 | 15.16 | 14.12 | 12.82 | 14.62 | 13.30 | 11.98 | 10.29 |
| 1926..... | 14.08 | 13.38 | 12.67 | 13.34 | 12.71 | 12.71 | 13.11 | 12.05 | 9.88 | 8.50 |
| 1927..... | 19.28 | 18.21 | 17.49 | 18.23 | 17.74 | 18.08 | 18.66 | 17.26 | 14.09 | 12.88 |
| 1928..... | 23.85 | 22.91 | 22.26 | 22.95 | 22.26 | 22.96 | 22.63 | 21.79 | 17.64 | 16.62 |
| 1929..... | 16.98 | 16.08 | 15.16 | 16.11 | 15.39 | 15.86 | 15.75 | 14.86 | 11.42 | 10.17 |
| 1929 | 20.50 | 19.20 | 18.10 | 19.20 | 18.20 | 18.20 | 17.50 | 16.80 | 13.20 | 12.20 |
| January..... | 15.62 | 15.00 | 14.25 | 15.00 | 14.25 | 14.31 | 15.25 | 13.62 | 10.44 | 9.50 |
| February..... | 14.62 | 13.62 | 13.12 | 13.62 | 13.12 | 13.75 | 14.50 | 13.25 | 10.50 | 9.25 |
| March..... | 14.75 | 14.00 | 13.50 | 14.00 | 13.50 | 14.25 | 15.00 | 14.00 | 10.50 | 9.25 |
| April..... | 14.80 | 13.90 | 13.40 | 13.90 | 13.40 | 13.80 | 14.80 | 13.90 | 10.75 | 9.45 |
| May..... | 16.62 | 15.62 | 15.12 | 15.62 | 15.00 | 15.75 | 16.50 | 15.50 | 11.69 | 9.75 |
| June..... | 17.87 | 16.62 | 16.00 | 16.62 | 16.00 | 17.50 | 16.87 | 16.25 | 12.50 | 10.75 |
| July..... | 18.60 | 17.70 | 16.60 | 17.80 | 17.20 | 18.10 | 16.90 | 16.30 | 12.55 | 11.35 |
| August..... | 19.50 | 19.00 | 17.50 | 19.00 | 18.00 | 18.87 | 17.62 | 16.50 | 12.50 | 11.56 |
| September..... | 18.60 | 18.05 | 16.60 | 17.95 | 16.95 | 17.40 | 16.10 | 15.70 | 12.20 | 11.20 |
| October..... | 16.50 | 15.62 | 14.37 | 15.75 | 15.00 | 14.87 | 14.19 | 13.44 | 10.50 | 9.28 |
| November..... | 16.00 | 14.62 | 13.37 | 14.87 | 14.00 | 13.50 | 13.75 | 13.00 | 9.75 | 8.56 |
| December..... | | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade. Data 1920-1919 available in 1925 Yearbook, p. 1199, Table 610.

TABLE 430.—*Hides, c*

Chicago, 1920-1929

| Year | Ex- tremes | Heavy steers | Heavy cows | No. 1 buffs | No. 2 buffs | Bulls | Country packer | Country brands | No. 1 calf- skins | No. 1 kip- skins |
|----------------|---------------|-----------------|---------------|----------------|----------------|--------------|-------------------|-------------------|-------------------------|------------------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1920..... | 22.79 | 24.20 | 19.27 | 18.93 | 17.93 | 18.76 | 20.60 | 14.94 | 40.98 | 33.97 |
| 1921..... | 8.95 | 9.35 | 7.32 | 7.10 | 5.77 | 5.43 | 7.43 | 5.33 | 18.57 | 15.58 |
| 1922..... | 12.93 | 12.03 | 10.85 | 10.86 | 9.52 | 8.23 | 12.53 | 8.42 | 18.95 | 17.29 |
| 1923..... | 11.65 | 11.39 | 10.43 | 10.45 | 9.26 | 8.93 | 10.12 | 8.70 | 17.18 | 15.12 |
| 1924..... | 11.86 | 11.31 | 9.24 | 9.63 | 8.63 | 7.86 | 9.81 | 8.23 | 20.39 | 16.62 |
| 1925..... | 14.41 | 12.94 | 11.64 | 12.26 | 11.25 | 9.46 | 12.52 | 10.54 | 21.88 | 18.12 |
| 1926..... | 13.46 | 11.63 | 9.54 | 10.70 | 9.70 | 8.03 | 10.52 | 9.00 | 18.02 | 16.12 |
| 1927..... | 18.60 | 16.02 | 14.85 | 16.26 | 15.26 | 11.49 | 15.54 | 13.89 | 20.47 | 19.96 |
| 1928..... | 22.04 | 18.53 | 18.05 | 19.71 | 18.71 | 14.88 | 19.18 | 17.38 | 27.84 | 25.23 |
| 1929..... | 14.98 | 12.09 | 11.55 | 12.82 | 11.82 | 8.92 | 11.88 | 10.80 | 20.72 | 18.72 |
| 1929 | | | | | | | | | | |
| January..... | 16.55 | 14.50 | 14.00 | 14.45 | 13.45 | 10.50 | 14.05 | 12.40 | 23.50 | 20.75 |
| February..... | 14.06 | 11.87 | 11.12 | 12.06 | 11.06 | 8.87 | 11.62 | 10.25 | 19.12 | 16.81 |
| March..... | 15.00 | 12.25 | 11.87 | 12.87 | 11.87 | 8.81 | 12.00 | 10.87 | 20.87 | 18.00 |
| April..... | 15.00 | 12.00 | 11.50 | 12.75 | 11.75 | 9.00 | 11.75 | 10.75 | 21.12 | 18.94 |
| May..... | 14.30 | 11.40 | 10.70 | 12.15 | 11.15 | 8.45 | 11.10 | 10.20 | 19.80 | 17.75 |
| June..... | 15.56 | 12.25 | 11.62 | 13.37 | 12.37 | 9.62 | 12.12 | 11.25 | 20.94 | 18.94 |
| July..... | 15.62 | 12.25 | 11.75 | 13.12 | 12.12 | 9.37 | 12.50 | 11.50 | 21.62 | 19.81 |
| August..... | 15.55 | 12.30 | 11.80 | 12.85 | 11.85 | 9.30 | 12.40 | 11.30 | 21.50 | 19.50 |
| September..... | 16.37 | 12.50 | 12.00 | 13.81 | 12.81 | 9.56 | 12.50 | 11.50 | 21.50 | 20.12 |
| October..... | 15.15 | 12.00 | 11.50 | 13.10 | 12.10 | 8.75 | 11.70 | 10.70 | 21.00 | 19.90 |
| November..... | 13.25 | 11.00 | 10.50 | 11.75 | 10.75 | 7.75 | 10.62 | 9.62 | 19.00 | 17.37 |
| December..... | 13.37 | 10.75 | 10.25 | 11.56 | 10.56 | 7.06 | 10.25 | 9.25 | 18.62 | 16.87 |

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade. Data 1893-1919 available in 1925 Yearbook, p. 1199, Table 611.

TABLE 431.—*Horses and mules: Number and value on farms, United States, January 1, 1910-1929*

| Jan. 1— | Horses | | | Mules | | |
|---------------------|------------------|----------------|----------------------|------------------|----------------|----------------------|
| | Number | Value per head | Farm value | Number | Value per head | Farm value |
| | <i>Thousands</i> | <i>Dollars</i> | <i>1,000 dollars</i> | <i>Thousands</i> | <i>Dollars</i> | <i>1,000 dollars</i> |
| 1910 (Apr. 15)..... | 19,833 | 108.03 | 2,142,524 | 4,210 | 120.20 | 506,049 |
| 1911..... | 20,277 | 111.46 | 2,259,981 | 4,323 | 125.92 | 544,359 |
| 1912..... | 20,509 | 105.91 | 2,172,694 | 4,362 | 120.51 | 525,657 |
| 1913..... | 20,567 | 110.77 | 2,278,222 | 4,386 | 124.31 | 545,245 |
| 1914..... | 20,962 | 109.32 | 2,291,638 | 4,449 | 123.85 | 551,017 |
| 1915..... | 21,195 | 103.33 | 2,190,102 | 4,479 | 112.36 | 503,271 |
| 1916..... | 21,159 | 101.60 | 2,149,786 | 4,593 | 113.83 | 522,831 |
| 1917..... | 21,210 | 102.89 | 2,182,307 | 4,723 | 118.15 | 558,006 |
| 1918..... | 21,555 | 104.24 | 2,246,970 | 4,873 | 128.81 | 627,679 |
| 1919..... | 21,482 | 98.45 | 2,114,897 | 4,954 | 135.83 | 672,922 |
| 1920..... | 19,948 | 96.52 | 1,915,653 | 5,475 | 148.46 | 812,828 |
| 1921..... | 19,134 | 84.57 | 1,618,120 | 5,586 | 117.52 | 656,455 |
| 1922..... | 18,564 | 71.18 | 1,321,996 | 5,638 | 89.14 | 502,503 |
| 1923..... | 17,943 | 70.65 | 1,267,624 | 5,702 | 87.17 | 497,044 |
| 1924..... | 17,222 | 65.48 | 1,127,619 | 5,730 | 85.90 | 492,209 |
| 1925..... | 16,470 | 64.29 | 1,058,012 | 5,725 | 82.73 | 473,646 |
| 1926..... | 15,830 | 65.50 | 1,036,843 | 5,740 | 81.49 | 467,760 |
| 1927..... | 15,133 | 64.14 | 970,703 | 5,652 | 74.57 | 421,467 |
| 1928..... | 14,540 | 67.05 | 974,855 | 5,532 | 79.71 | 440,958 |
| 1929..... | 14,029 | 69.95 | 981,331 | 5,447 | 82.20 | 447,727 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board. Figures in italics are census returns. Figures for earlier years are shown in 1923 Yearbook. Later, revised figures for 1923, 1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Preliminary.

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TABLE 432.—Horses and horse colls: Estimated number on farms and value per head, by States, January 1, 1925-1929

| State and division | Number | | | | | Value per head ¹ | | | | |
|---------------------|-----------|-----------|-----------|-----------|-------------------|-----------------------------|---------|---------|---------|-------------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 ² | 1925 | 1926 | 1927 | 1928 | 1929 ² |
| | Thousands | Thousands | Thousands | Thousands | Thousands | Dollars | Dollars | Dollars | Dollars | Dollars |
| Maine..... | 84 | 80 | 78 | 74 | 72 | 119.00 | 129.00 | 130.00 | 135.00 | 140.00 |
| New Hampshire..... | 32 | 30 | 28 | 26 | 24 | 105.00 | 100.00 | 105.00 | 120.00 | 121.00 |
| Vermont..... | 64 | 61 | 57 | 54 | 53 | 104.00 | 110.00 | 110.00 | 119.00 | 124.00 |
| Massachusetts..... | 45 | 41 | 39 | 37 | 35 | 124.00 | 119.00 | 119.00 | 135.00 | 130.00 |
| Rhode Island..... | 6 | 6 | 5 | 5 | 4 | 124.00 | 120.00 | 120.00 | 135.00 | 130.00 |
| Connecticut..... | 35 | 33 | 32 | 29 | 27 | 127.00 | 120.00 | 128.00 | 140.00 | 145.00 |
| New York..... | 440 | 418 | 401 | 389 | 382 | 108.00 | 111.00 | 109.00 | 116.00 | 124.00 |
| New Jersey..... | 57 | 54 | 54 | 52 | 50 | 109.00 | 107.00 | 109.00 | 109.00 | 114.00 |
| Pennsylvania..... | 410 | 390 | 374 | 350 | 349 | 96.00 | 103.00 | 99.00 | 112.00 | 116.00 |
| North Atlantic..... | 1,173 | 1,113 | 1,068 | 1,025 | 996 | 105.63 | 109.51 | 108.06 | 117.32 | 122.49 |
| Ohio..... | 630 | 598 | 568 | 542 | 520 | 85.00 | 91.00 | 95.00 | 101.00 | 105.00 |
| Indiana..... | 556 | 548 | 540 | 522 | 517 | 69.00 | 78.00 | 80.00 | 82.00 | 82.00 |
| Illinois..... | 1,030 | 978 | 929 | 874 | 839 | 69.00 | 74.00 | 74.00 | 74.00 | 77.00 |
| Michigan..... | 482 | 463 | 444 | 426 | 409 | 84.00 | 89.00 | 89.00 | 98.00 | 110.00 |
| Wisconsin..... | 604 | 591 | 579 | 567 | 544 | 88.00 | 93.00 | 95.00 | 98.00 | 102.00 |
| Minnesota..... | 835 | 827 | 819 | 803 | 787 | 77.00 | 81.00 | 77.00 | 79.00 | 82.00 |
| Iowa..... | 1,190 | 1,145 | 1,111 | 1,089 | 1,046 | 72.00 | 74.00 | 74.00 | 75.00 | 78.00 |
| Missouri..... | 708 | 670 | 636 | 604 | 574 | 48.00 | 49.00 | 48.00 | 50.00 | 53.00 |
| North Dakota..... | 731 | 708 | 673 | 633 | 589 | 56.00 | 56.00 | 53.00 | 53.00 | 52.00 |
| South Dakota..... | 720 | 684 | 643 | 611 | 583 | 48.00 | 49.00 | 47.00 | 53.00 | 57.00 |
| Nebraska..... | 862 | 840 | 815 | 788 | 764 | 58.00 | 61.00 | 56.00 | 59.00 | 60.00 |
| Kansas..... | 931 | 894 | 840 | 798 | 766 | 46.00 | 48.00 | 41.00 | 43.00 | 49.00 |
| North Central..... | 9,200 | 8,940 | 8,597 | 8,257 | 7,948 | 65.55 | 68.93 | 67.84 | 70.52 | 73.35 |
| Delaware..... | 23 | 22 | 21 | 20 | 19 | 74.00 | 79.00 | 69.00 | 79.00 | 88.00 |
| Maryland..... | 117 | 112 | 104 | 100 | 97 | 74.00 | 77.00 | 78.00 | 89.00 | 92.00 |
| Virginia..... | 261 | 238 | 224 | 206 | 198 | 71.00 | 66.00 | 66.00 | 70.00 | 78.00 |
| West Virginia..... | 117 | 140 | 133 | 128 | 124 | 76.00 | 75.00 | 74.00 | 84.00 | 89.00 |
| North Carolina..... | 130 | 120 | 112 | 105 | 98 | 99.00 | 86.00 | 83.00 | 87.00 | 86.00 |
| South Carolina..... | 55 | 49 | 45 | 42 | 40 | 97.00 | 89.00 | 76.00 | 81.00 | 82.00 |
| Georgia..... | 56 | 51 | 46 | 41 | 39 | 86.00 | 83.00 | 74.00 | 78.00 | 78.00 |
| Florida..... | 29 | 28 | 27 | 26 | 25 | 98.00 | 97.00 | 82.00 | 83.00 | 87.00 |
| South Atlantic..... | 818 | 760 | 712 | 668 | 640 | 80.60 | 76.66 | 73.51 | 80.27 | 84.46 |
| Kentucky..... | 314 | 305 | 293 | 284 | 278 | 50.00 | 50.00 | 47.00 | 53.00 | 56.00 |
| Tennessee..... | 243 | 231 | 219 | 210 | 202 | 61.00 | 53.00 | 54.00 | 60.00 | 60.00 |
| Alabama..... | 90 | 86 | 82 | 73 | 65 | 70.00 | 68.00 | 63.00 | 66.00 | 66.00 |
| Mississippi..... | 135 | 125 | 118 | 106 | 100 | 63.00 | 60.00 | 56.00 | 61.00 | 58.00 |
| Arkansas..... | 189 | 169 | 157 | 146 | 136 | 42.00 | 42.00 | 40.00 | 43.00 | 41.00 |
| Louisiana..... | 132 | 126 | 113 | 107 | 102 | 62.00 | 55.00 | 49.00 | 52.00 | 53.00 |
| Oklahoma..... | 614 | 589 | 565 | 537 | 516 | 41.00 | 37.00 | 35.00 | 38.00 | 39.00 |
| Texas..... | 857 | 848 | 788 | 780 | 780 | 54.00 | 48.00 | 44.00 | 45.00 | 46.00 |
| South Central..... | 2,573 | 2,479 | 2,335 | 2,243 | 2,179 | 51.54 | 47.57 | 44.41 | 47.42 | 48.20 |
| Montana..... | 596 | 576 | 547 | 531 | 515 | 32.00 | 29.00 | 30.00 | 31.00 | 31.00 |
| Idaho..... | 233 | 226 | 221 | 214 | 210 | 45.00 | 52.00 | 52.00 | 51.00 | 54.00 |
| Wyoming..... | 200 | 198 | 194 | 190 | 186 | 29.00 | 29.00 | 31.00 | 31.00 | 32.00 |
| Colorado..... | 367 | 352 | 331 | 324 | 308 | 43.00 | 47.00 | 44.00 | 43.00 | 47.00 |
| New Mexico..... | 188 | 175 | 170 | 168 | 163 | 38.00 | 37.00 | 33.00 | 31.00 | 36.00 |
| Arizona..... | 112 | 106 | 101 | 98 | 90 | 59.00 | 50.00 | 50.00 | 49.00 | 51.00 |
| Utah..... | 110 | 106 | 104 | 102 | 100 | 61.00 | 61.00 | 61.00 | 61.00 | 63.00 |
| Nevada..... | 50 | 47 | 44 | 42 | 41 | 56.00 | 53.00 | 53.00 | 50.00 | 58.00 |
| Washington..... | 242 | 230 | 218 | 209 | 205 | 63.00 | 62.00 | 62.00 | 65.00 | 67.00 |
| Oregon..... | 225 | 214 | 201 | 191 | 181 | 67.00 | 65.00 | 62.00 | 65.00 | 65.00 |
| California..... | 314 | 302 | 290 | 278 | 267 | 78.00 | 76.00 | 76.00 | 74.00 | 78.00 |
| Far Western..... | 2,637 | 2,532 | 2,421 | 2,347 | 2,266 | 48.90 | 48.24 | 47.94 | 47.86 | 49.99 |
| United States..... | 16,470 | 15,830 | 15,133 | 14,540 | 14,029 | 64.29 | 65.50 | 64.14 | 67.05 | 69.95 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board. Later, revised figures for 1928, 1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Sum of total value of subgroups (classified by age), divided by total number and rounded to nearest dollar for States. Division and United States averages not rounded.

² Preliminary.

TABLE 433.—*Mules and mule colts: Estimated number on farms and value per head, by States, January 1, 1925-1929*

| State and division | Number | | | | | Value per head ¹ | | | | |
|---------------------|----------------|----------------|----------------|----------------|-------------------|-----------------------------|---------|---------|---------|-------------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 ² | 1925 | 1926 | 1927 | 1928 | 1929 ² |
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Dollars | Dollars | Dollars | Dollars | Dollars |
| New York..... | 7 | 7 | 7 | 7 | 6 | 115.00 | 112.00 | 120.00 | 125.00 | 120.00 |
| New Jersey..... | 5 | 5 | 5 | 5 | 5 | 125.00 | 114.00 | 118.00 | 118.00 | 123.00 |
| Pennsylvania..... | 53 | 53 | 52 | 51 | 51 | 105.00 | 113.00 | 110.00 | 121.00 | 127.00 |
| North Atlantic..... | 65 | 65 | 64 | 63 | 62 | 107.74 | 113.08 | 111.77 | 120.98 | 125.71 |
| Ohio..... | 33 | 32 | 33 | 33 | 32 | 93.00 | 96.00 | 94.00 | 103.00 | 101.00 |
| Indiana..... | 101 | 99 | 101 | 101 | 101 | 76.00 | 86.00 | 86.00 | 86.00 | 87.00 |
| Illinois..... | 168 | 165 | 160 | 150 | 144 | 80.00 | 85.00 | 85.00 | 82.00 | 86.00 |
| Michigan..... | 7 | 7 | 8 | 8 | 7 | 83.00 | 86.00 | 86.00 | 93.00 | 102.00 |
| Wisconsin..... | 7 | 7 | 7 | 7 | 7 | 85.00 | 87.00 | 86.00 | 95.00 | 95.00 |
| Minnesota..... | 13 | 13 | 14 | 14 | 14 | 80.00 | 79.00 | 81.00 | 83.00 | 83.00 |
| Iowa..... | 97 | 98 | 100 | 98 | 93 | 83.00 | 85.00 | 83.00 | 84.00 | 86.00 |
| Missouri..... | 372 | 365 | 347 | 330 | 313 | 67.00 | 71.00 | 66.00 | 68.00 | 75.00 |
| North Dakota..... | 9 | 9 | 10 | 10 | 10 | 62.00 | 59.00 | 55.00 | 57.00 | 55.00 |
| South Dakota..... | 21 | 22 | 22 | 22 | 22 | 61.00 | 64.00 | 57.00 | 63.00 | 65.00 |
| Nebraska..... | 120 | 120 | 118 | 110 | 106 | 74.00 | 78.00 | 69.00 | 74.00 | 76.00 |
| Kansas..... | 260 | 252 | 237 | 213 | 198 | 63.00 | 66.00 | 57.00 | 60.00 | 65.00 |
| North Central..... | 1,208 | 1,189 | 1,157 | 1,096 | 1,047 | 71.50 | 75.75 | 71.37 | 73.52 | 77.52 |
| Delaware..... | 9 | 9 | 9 | 9 | 9 | 90.00 | 100.00 | 91.00 | 95.00 | 96.00 |
| Maryland..... | 31 | 31 | 30 | 29 | 28 | 94.00 | 104.00 | 101.00 | 113.00 | 111.00 |
| Virginia..... | 104 | 104 | 103 | 105 | 105 | 91.00 | 87.00 | 86.00 | 92.00 | 97.00 |
| West Virginia..... | 15 | 15 | 14 | 14 | 14 | 86.00 | 85.00 | 78.00 | 81.00 | 86.00 |
| North Carolina..... | 279 | 276 | 279 | 279 | 276 | 119.00 | 117.00 | 107.00 | 119.00 | 124.00 |
| South Carolina..... | 199 | 193 | 185 | 179 | 177 | 122.00 | 120.00 | 95.00 | 105.00 | 105.00 |
| Georgia..... | 338 | 347 | 347 | 347 | 347 | 115.00 | 112.00 | 95.00 | 105.00 | 109.00 |
| Florida..... | 43 | 43 | 43 | 43 | 42 | 139.00 | 134.00 | 117.00 | 119.00 | 124.00 |
| South Atlantic..... | 1,018 | 1,018 | 1,010 | 1,005 | 998 | 114.63 | 112.46 | 98.28 | 107.95 | 111.42 |
| Kentucky..... | 301 | 304 | 301 | 295 | 292 | 63.00 | 63.00 | 58.00 | 67.00 | 69.00 |
| Tennessee..... | 352 | 356 | 352 | 341 | 321 | 74.00 | 72.00 | 69.00 | 75.00 | 80.00 |
| Alabama..... | 309 | 312 | 315 | 321 | 327 | 90.00 | 95.00 | 84.00 | 95.00 | 95.00 |
| Mississippi..... | 330 | 336 | 343 | 336 | 336 | 89.00 | 86.00 | 79.00 | 87.00 | 85.00 |
| Arkansas..... | 339 | 346 | 329 | 332 | 339 | 64.00 | 63.00 | 59.00 | 64.00 | 65.00 |
| Louisiana..... | 174 | 176 | 169 | 167 | 167 | 90.00 | 90.00 | 79.00 | 85.00 | 89.00 |
| Oklahoma..... | 369 | 369 | 365 | 347 | 333 | 61.00 | 57.00 | 51.00 | 52.00 | 58.00 |
| Texas..... | 1,042 | 1,052 | 1,031 | 1,021 | 1,021 | 83.00 | 75.00 | 69.00 | 71.00 | 71.00 |
| South Central..... | 3,216 | 3,251 | 3,205 | 3,160 | 3,136 | 77.19 | 74.05 | 68.06 | 72.94 | 74.49 |
| Montana..... | 11 | 11 | 11 | 11 | 11 | 47.00 | 50.00 | 45.00 | 47.00 | 47.00 |
| Idaho..... | 8 | 8 | 8 | 7 | 7 | 52.00 | 61.00 | 60.00 | 55.00 | 60.00 |
| Wyoming..... | 6 | 6 | 6 | 5 | 5 | 49.00 | 49.00 | 49.00 | 52.00 | 55.00 |
| Colorado..... | 39 | 38 | 36 | 33 | 32 | 57.00 | 59.00 | 55.00 | 56.00 | 58.00 |
| New Mexico..... | 33 | 34 | 34 | 31 | 30 | 58.00 | 54.00 | 45.00 | 45.00 | 50.00 |
| Arizona..... | 12 | 12 | 12 | 12 | 12 | 85.00 | 87.00 | 77.00 | 77.00 | 82.00 |
| Utah..... | 4 | 4 | 4 | 4 | 4 | 62.00 | 64.00 | 62.00 | 61.00 | 67.00 |
| Nevada..... | 4 | 4 | 4 | 4 | 4 | 62.00 | 64.00 | 60.00 | 51.00 | 62.00 |
| Washington..... | 27 | 27 | 28 | 29 | 29 | 68.00 | 67.00 | 72.00 | 73.00 | 74.00 |
| Oregon..... | 18 | 19 | 20 | 20 | 19 | 72.00 | 73.00 | 70.00 | 72.00 | 71.00 |
| California..... | 56 | 54 | 53 | 52 | 51 | 95.00 | 92.00 | 89.00 | 85.00 | 87.00 |
| Far Western..... | 218 | 217 | 216 | 208 | 204 | 70.29 | 69.67 | 66.36 | 66.34 | 68.43 |
| United States..... | 5,725 | 5,740 | 5,652 | 5,532 | 5,447 | 82.73 | 81.49 | 74.57 | 79.71 | 82.20 |

Bureau of Agricultural Economics. Estimates of crop-reporting board. Later, revised figures for 1928, 1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Sum of total value of subgroups (classified by age) divided by total number and rounded to nearest dollar for States. Division and United States averages not rounded.

² Preliminary.

TABLE 434.—*Horses and mules: Farm value per head, by age groups, United States, January 1, 1910-1930*

| Jan. 1— | Horses | | | Mules | | |
|-----------|------------------|---------------------|------------------|------------------|---------------------|------------------|
| | Under 1 year old | 1 and under 2 years | 2 years and over | Under 1 year old | 1 and under 2 years | 2 years and over |
| | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 1910..... | 46.05 | 72.63 | 116.57 | 56.76 | 84.53 | 128.96 |
| 1911..... | 48.09 | 75.68 | 120.04 | 59.89 | 88.13 | 135.11 |
| 1912..... | 45.75 | 71.96 | 114.24 | 56.12 | 83.00 | 129.46 |
| 1913..... | 48.75 | 76.54 | 121.06 | 59.31 | 86.56 | 134.05 |
| 1914..... | 47.95 | 74.87 | 119.77 | 57.45 | 83.87 | 133.76 |
| 1915..... | 45.36 | 70.62 | 113.10 | 51.80 | 76.46 | 121.46 |
| 1916..... | 44.30 | 69.08 | 111.34 | 51.59 | 76.82 | 123.55 |
| 1917..... | 45.17 | 70.21 | 112.64 | 53.98 | 80.28 | 128.17 |
| 1918..... | 45.20 | 70.21 | 114.30 | 57.61 | 86.32 | 130.88 |
| 1919..... | 42.62 | 65.94 | 108.17 | 59.14 | 89.14 | 147.65 |
| 1920..... | 37.22 | 58.81 | 103.52 | 60.16 | 90.14 | 160.55 |
| 1921..... | 31.59 | 49.66 | 90.35 | 47.55 | 71.77 | 125.85 |
| 1922..... | 26.50 | 41.07 | 75.61 | 35.55 | 52.82 | 94.81 |
| 1923..... | 26.51 | 40.48 | 74.53 | 34.35 | 50.94 | 92.14 |
| 1924..... | 24.68 | 37.36 | 68.64 | 31.83 | 47.06 | 90.42 |
| 1925..... | 23.80 | 37.09 | 66.83 | 30.65 | 46.63 | 86.20 |
| 1926..... | 24.82 | 37.75 | 68.18 | 31.30 | 47.88 | 84.76 |
| 1927..... | 23.75 | 37.37 | 66.75 | 29.41 | 43.91 | 77.36 |
| 1928..... | 24.96 | 39.21 | 69.81 | 31.19 | 46.55 | 82.56 |
| 1929..... | 26.34 | 41.11 | 72.84 | 32.72 | 48.63 | 84.89 |

Bureau of Agricultural Economics. Based on returns from special price reporters. Average value, by States, weighted by estimated numbers each age group.

TABLE 435.—*Horses: Price per head received by producers, United States, 1910-1929*

| Year | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Weighted average |
|-----------|---------|---------|---------|---------|--------|---------|---------|---------|----------|---------|---------|---------|------------------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1910..... | 140 | 147 | 150 | 154 | 148 | 151 | 148 | 148 | 145 | 144 | 143 | 141 | 146 |
| 1911..... | 143 | 144 | 145 | 147 | 146 | 145 | 139 | 141 | 139 | 137 | 136 | 134 | 141 |
| 1912..... | 134 | 137 | 140 | 142 | 144 | 145 | 142 | 142 | 141 | 140 | 139 | 139 | 140 |
| 1913..... | 140 | 146 | 146 | 148 | 145 | 146 | 143 | 141 | 141 | 138 | 136 | 135 | 142 |
| 1914..... | 137 | 139 | 138 | 138 | 139 | 136 | 137 | 135 | 132 | 131 | 130 | 130 | 135 |
| 1915..... | 130 | 132 | 132 | 132 | 133 | 132 | 134 | 131 | 131 | 129 | 127 | 126 | 130 |
| 1916..... | 128 | 129 | 131 | 133 | 134 | 132 | 133 | 131 | 131 | 130 | 129 | 129 | 130 |
| 1917..... | 129 | 131 | 133 | 136 | 138 | 137 | 135 | 132 | 132 | 130 | 129 | 129 | 132 |
| 1918..... | 130 | 133 | 137 | 137 | 136 | 135 | 132 | 131 | 128 | 126 | 122 | 121 | 130 |
| 1919..... | 120 | 121 | 124 | 127 | 129 | 127 | 127 | 125 | 119 | 114 | 113 | 113 | 121 |
| 1920..... | 118 | 123 | 127 | 131 | 132 | 130 | 127 | 124 | 119 | 112 | 103 | 97 | 119 |
| 1921..... | 96 | 96 | 98 | 101 | 98 | 98 | 94 | 93 | 89 | 85 | 82 | 81 | 92 |
| 1922..... | 82 | 84 | 86 | 87 | 89 | 88 | 88 | 86 | 84 | 81 | 79 | 79 | 84 |
| 1923..... | 81 | 85 | 85 | 86 | 88 | 87 | 85 | 83 | 82 | 80 | 78 | 75 | 82 |
| 1924..... | 73 | 74 | 75 | 76 | 78 | 77 | 77 | 79 | 78 | 77 | 76 | 73 | 76 |
| 1925..... | 73 | 78 | 81 | 83 | 82 | 81 | 81 | 80 | 77 | 76 | 75 | 74 | 78 |
| 1926..... | 75 | 80 | 82 | 84 | 84 | 83 | 82 | 80 | 78 | 77 | 75 | 73 | 79 |
| 1927..... | 73 | 77 | 79 | 80 | 81 | 80 | 80 | 80 | 78 | 76 | 75 | 75 | 77 |
| 1928..... | 77 | 82 | 85 | 85 | 86 | 86 | 85 | 84 | 82 | 80 | 79 | 78 | 82 |
| 1929..... | 77 | 79 | 83 | 85 | 85 | 84 | 84 | 82 | 82 | 79 | 78 | 77 | 81 |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by number of horses Jan. 1, by States; yearly prices obtained by weighing monthly prices by receipts at public stock yards.

HONEY AND BEESWAX

TABLE 436.—Honey: Monthly average prices in producing sections and at consuming markets, 1920-1929

EXTRACTED HONEY, PER POUND

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| CALIFORNIA WHITE ORANGE | | | | | | | | | | | | |
| F. o. b. Southern California shipping points: ¹ | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1920 | 18½ | 18½ | 17½ | 17½ | 21 | 19½ | 19½ | 19½ | 18½ | 18½ | 17½ | 16½ |
| 1921 | 16½ | 13½ | 13 | 12 | 11½ | 11½ | 9½ | 10½ | 11 | 11½ | 12½ | 11½ |
| 1922 | 11½ | 11½ | 11 | 8½ | 8½ | 9 | 9½ | 9½ | 9½ | 10½ | 10½ | 10½ |
| 1923 | 10½ | 10½ | 10½ | 10½ | 11½ | 12 | 12 | 12 | 13 | 13½ | 13½ | 13½ |
| 1924 | 13 | 14 | 14½ | 11½ | 13½ | 13½ | 12 | 12½ | 13 | 13½ | 14½ | 14½ |
| 1925 | 14½ | 15 | 15 | 13½ | 13½ | 13 | 11½ | 11½ | 11½ | 14½ | 15½ | 15½ |
| 1926 | 12½ | 11½ | 11½ | 10½ | 9½ | 8½ | 8½ | 8½ | 8½ | 8½ | 9½ | 10 |
| 1927 | 7½ | 9 | 8½ | 8½ | 8½ | 8½ | 9 | 9 | 9½ | 9½ | 9½ | 9½ |
| 1928 | 10 | 10 | 10 | 9½ | 8½ | 8½ | 9 | 9½ | 9½ | 9½ | 9½ | 9½ |
| 1929 | 9½ | 9½ | 9½ | 9½ | 10 | 10½ | 11 | 11½ | 11 | 11 | 12 | 12 |
| New York City: ² | | | | | | | | | | | | |
| 1920 | 20½ | 18½ | 17½ | 19½ | 20 | 21½ | 18 | 17½ | 18½ | 17 | 17 | 16½ |
| 1921 | 17½ | 14½ | 12½ | 11 | 11½ | 12 | 11½ | 11 | 12½ | 12½ | 12½ | 12½ |
| 1922 | 13½ | 13 | 13½ | 12½ | 13 | 12 | 11½ | 11½ | 11½ | 12 | 12½ | 12½ |
| 1923 | 12½ | 12½ | 12½ | 12½ | 13 | 13½ | 13½ | 13½ | 14½ | 14 | 15 | 16 |
| 1924 | 15½ | 16 | 15 | 15½ | 15½ | 13½ | 14½ | 14 | 13½ | 13½ | 13½ | 14½ |
| 1925 | 15½ | 15 | 14½ | 11 | 11 | 11½ | 11½ | 11½ | 11½ | 11½ | 11½ | 12½ |
| 1926 | 15½ | 15 | 14½ | 11 | 11 | 11½ | 11½ | 12½ | 13 | 12½ | 13 | 13 |
| 1927 | 12½ | 12½ | 11 | 11 | 11½ | 12½ | 12½ | 12½ | 12½ | 13 | 12½ | 12½ |
| 1928 | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 13 | 12½ | 12½ |
| 1929 | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 13 | 13½ | 13½ | 13½ |
| INTERMOUNTAIN WHITE SWEET CLOVER AND ALFALFA | | | | | | | | | | | | |
| F. o. b. Intermountain points: ³ | | | | | | | | | | | | |
| 1921 | 8½ | 8½ | 8½ | 8½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 8 | 8½ |
| 1922 | 8½ | 8 | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 8 | 8 | 8 | 8 |
| 1923 | 7½ | 8 | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 8 | 8 | 9 | 9 |
| 1924 | 9 | 9½ | 9½ | 9½ | 9½ | 9 | 8½ | 9 | 9 | 9 | 9 | 9½ |
| 1925 | 9½ | 9½ | 9½ | 9½ | 9 | 8½ | 8½ | 8½ | 8½ | 8½ | 8½ | 8½ |
| 1926 | 8 | 8½ | 8 | 7½ | 7½ | 7½ | 7½ | 7 | 6½ | 6½ | 6½ | 6½ |
| 1927 | 6½ | 6½ | 6 | 5½ | 5½ | 6 | 6 | 6½ | 7 | 7½ | 7½ | 7½ |
| 1928 | 7½ | 7½ | 7½ | 7½ | 7½ | 7 | 7½ | 7 | 7½ | 7½ | 7 | 7 |
| 1929 | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7 | 7½ | 7½ | 7½ | 7½ | 7½ |
| WHITE CLOVER | | | | | | | | | | | | |
| F. o. b. New York and North Central States: ⁴ | | | | | | | | | | | | |
| 1921 | 10½ | 10 | 10½ | 10½ | 10½ | 11½ | 11½ | 11 | 9½ | 9½ | 9½ | 10½ |
| 1922 | 11 | 10½ | 10 | 10 | 10½ | 11 | 11 | 11½ | 11 | 11 | 10½ | 11 |
| 1923 | 10½ | 10½ | 10½ | 11 | 11 | 10½ | 10½ | 11 | 10½ | 10½ | 10½ | 10½ |
| 1924 | 10½ | 10½ | 10½ | 11 | 11 | 10½ | 10½ | 11 | 10½ | 10½ | 11½ | 11 |
| 1925 | 11½ | 11½ | 11½ | 11½ | 11½ | 11½ | 11½ | 10½ | 11 | 11 | 10½ | 10½ |
| 1926 | 9½ | 10 | 9½ | 9½ | 9½ | 10½ | 10½ | 10 | 9½ | 9½ | 10 | 9½ |
| 1927 | 10½ | 10 | 9½ | 9½ | 9½ | 8½ | 8½ | 9 | 8½ | 8½ | 8½ | 8½ |
| 1928 | 8½ | 8½ | 8 | 8 | 8 | 8½ | 8½ | 9 | 8½ | 8½ | 8½ | 8½ |
| 1929 | 8½ | 8½ | 9 | 9½ | 8½ | 9 | 9½ | 8½ | 8½ | 8½ | 8½ | 8 |
| NORTHEASTERN BUCKWHEAT | | | | | | | | | | | | |
| F. o. b. New York and Pennsylvania points: ⁴ | | | | | | | | | | | | |
| 1921 | 7 | 8 | 7½ | 7½ | 8 | 8 | 8½ | 6½ | 9 | 8½ | 7½ | 8 |
| 1922 | 7½ | 8 | 8½ | 8½ | 8 | 8 | 8½ | 6½ | 7½ | 8 | 8 | 8 |
| 1923 | 9 | 9 | 8½ | 8½ | 8½ | 8½ | 8½ | 9 | 9 | 9½ | 9 | 9 |
| 1924 | 8½ | 9 | 10 | 9 | 9 | 8½ | 8½ | 9 | 9 | 8½ | 8½ | 8½ |
| 1925 | 8 | 7½ | 7½ | 7 | 6½ | 6½ | 6 | 6½ | 7 | 7 | 7 | 8 |
| 1926 | 8½ | 7 | 7½ | 7½ | 8½ | 8½ | 8 | 8 | 7½ | 7½ | 7½ | 7½ |
| 1927 | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ |
| 1928 | 7½ | 7½ | 7 | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ |
| 1929 | 7½ | 7½ | 7 | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ | 7½ |

See footnotes at end of table.

TABLE 436.—*Honey: Monthly average prices in producing sections and at consuming markets, 1920-1929—Continued*

COMB HONEY, 24-SECTION CASES

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| WHITE CLOVER COMB, NO. 1 AND FANCY | | | | | | | | | | | | |
| F. o. b. New York and North Central States: ¹ | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1921..... | 5.00 | 5.10 | 5.00 | 4.50 | ----- | ----- | 4.45 | 5.00 | 5.10 | 5.00 | 5.10 | 4.65 |
| 1922..... | 4.75 | 4.75 | ----- | ----- | 4.00 | ----- | 5.00 | 5.00 | 5.25 | 5.10 | 4.75 | 5.15 |
| 1923..... | 4.75 | 4.75 | 5.05 | 4.80 | 5.50 | ----- | 4.80 | 4.85 | 4.95 | 4.80 | 5.10 | 4.95 |
| 1924..... | 4.95 | 4.95 | 4.75 | 4.90 | 5.25 | 4.50 | 5.10 | 5.20 | 5.00 | 5.00 | 4.65 | 4.45 |
| 1925..... | 4.25 | 4.25 | 4.25 | 4.00 | 4.00 | 4.00 | 4.25 | 4.75 | 4.50 | 4.25 | 4.25 | 4.25 |
| 1926..... | 4.50 | 5.25 | 5.25 | 5.25 | ----- | 5.00 | 5.00 | 4.75 | 4.25 | 4.75 | 4.50 | 4.80 |
| 1927..... | 4.80 | 4.80 | 4.50 | 1.80 | 1.50 | 4.25 | 4.50 | 4.50 | 4.50 | 4.50 | 4.80 | 4.50 |
| 1928..... | 4.80 | 4.50 | 4.25 | 4.25 | 4.50 | 4.25 | 4.50 | 4.50 | 4.25 | 4.00 | 4.00 | 4.00 |

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¹ Price to beekeepers or other shippers in car lots to July, 1923; thereafter, price in large lots, mostly less than car lots.² Sales by original receivers to bottlers, confectioners, bakers, and jobbers.³ Price to beekeepers and other shippers, in car lots.⁴ Price to beekeepers in large lots, mostly less than car lots.TABLE 437.—*Beeswax: Monthly average price per pound of domestic beeswax at Chicago, 1920-1928*

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Chicago: ¹ | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| Light— | | | | | | | | | | | | |
| 1920..... | 44 | 41½ | 42¾ | 43¾ | 45¾ | 44 | 43¾ | 41 | 40 | 40¾ | 37 | 34¾ |
| 1921..... | 31½ | 31¼ | 30½ | 31 | 32¼ | 31½ | 31¾ | 29 | 29 | 30¼ | 30¼ | 31 |
| 1922..... | 31 | 31 | 29¾ | 28¾ | 33 | 31¼ | 31½ | 30¾ | 31 | 31½ | 31½ | 30½ |
| 1923..... | 30¾ | 31½ | 32 | 32½ | 32 | 32 | 31 | 29 | 30 | 30 | 29 | 29½ |
| 1924..... | 29¼ | 28½ | 29 | 31¼ | 28¾ | 27½ | 27 | 27 | 29 | 32½ | 32¼ | 33¼ |
| 1925..... | 35 | 35 | 38 | 41¾ | 38 | 35 | 33½ | 33½ | 31 | 37¾ | 38 | 38 |
| 1926..... | ----- | 40 | ----- | ----- | ----- | ----- | 39½ | 38½ | 38½ | 39½ | 39 | 39 |
| 1927..... | 39 | 39 | 40 | 40 | 40 | 40½ | 41 | 41 | 41 | 43 | 41½ | 41½ |
| 1928..... | 41½ | 41 | 40½ | 40½ | 41½ | 41½ | ----- | 41 | 41 | 41 | 41½ | 42½ |
| 1929..... | 42½ | 41½ | 41½ | 41½ | 38¾ | 37 | 37¾ | 36¾ | 41½ | 37 | ----- | ----- |
| Dark— | | | | | | | | | | | | |
| 1920..... | 38½ | 36¼ | 39 | 40¾ | 42 | 40½ | 39½ | 37 | 35½ | 36½ | 34½ | 32¼ |
| 1921..... | 29¼ | 28½ | 27¾ | 25¾ | 25¼ | 27¾ | 26¼ | 25¾ | 26½ | 27 | 27¼ | 27½ |
| 1922..... | 28½ | 28 | 24½ | 25½ | 29 | 28 | 29 | 28 | 27¼ | 28 | 27¾ | 27¾ |
| 1923..... | 28 | 28½ | 28½ | 28¾ | 29 | 29¼ | 28½ | 25½ | 25¼ | 26 | 26 | 24 |
| 1924..... | 26 | 26¼ | 26 | 27 | 25¼ | 25½ | 25½ | 24½ | 26 | 29 | 28 | 27½ |
| 1925..... | 31 | 31 | 35¾ | 36¾ | 34 | 29½ | 29½ | 20¾ | 29½ | 34½ | 34 | 34 |
| 1926..... | ----- | ----- | ----- | ----- | ----- | ----- | 33 | 33 | ----- | ----- | ----- | ----- |
| 1927..... | ----- | ----- | 34½ | 34½ | 34½ | 35 | 35 | 35 | 35 | 37 | 38 | 38 |
| 1928..... | 38 | 38 | 38 | ----- | 37 | 37 | 36½ | ----- | ----- | ----- | ----- | ----- |
| 1929..... | ----- | 39½ | 40 | 38½ | 37¾ | 36 | 36 | 35 | 35 | 35 | 34½ | 34½ |

Bureau of Agricultural Economics.

¹ Sales by original receivers to wholesalers, polish and laundry-supply manufacturers, etc.

DAIRY AND POULTRY

TABLE 438.—*Milk cows and dairy cattle: Numbers and value per head in the United States, 1850, 1860, 1867-1929*

| Year | Milk cows on farms | | Dairy cattle on farms and elsewhere, Jan. 1 ³ | Year | Milk cows on farms | | Dairy cattle on farms and elsewhere, Jan. 1 ³ |
|-------------------|---------------------|-------------------------------------|--|-------------------|---------------------|-------------------------------------|--|
| | Number ¹ | Value per head, Jan. 1 ² | | | Number ¹ | Value per head, Jan. 1 ² | |
| | Thousands | Dollars | Thousands | | Thousands | Dollars | Thousands |
| 1850 ⁴ | 6,585 | | 10,100 | 1898 | 15,841 | 27.45 | 26,400 |
| 1860 ⁴ | 8,586 | | 13,500 | 1899 | 15,900 | 29.66 | 26,800 |
| 1867 | 8,349 | 28.74 | 12,000 | 1900 ⁴ | 17,156 | | |
| 1868 | 8,692 | 26.56 | 12,400 | 1900 | 16,292 | 30.18 | 24,965 |
| 1869 | 9,248 | 29.15 | 13,000 | 1901 | 16,834 | 28.65 | 25,863 |
| 1870 ⁴ | 8,955 | | | 1902 | 16,697 | 27.91 | 26,711 |
| 1870 | 10,096 | 32.70 | 14,000 | 1903 | 17,111 | 28.85 | 27,864 |
| 1871 | 10,023 | 33.89 | 14,100 | 1904 | 17,420 | 27.90 | 28,915 |
| 1872 | 10,304 | 29.45 | 14,700 | 1905 | 17,572 | 26.21 | 28,975 |
| 1873 | 10,576 | 26.72 | 15,400 | 1906 | 19,791 | 28.12 | 29,437 |
| 1874 | 10,705 | 25.63 | 15,800 | 1907 | 20,968 | 29.60 | 29,490 |
| 1875 | 10,907 | 25.74 | 16,300 | 1908 | 21,194 | 29.29 | 28,505 |
| 1876 | 11,085 | 25.61 | 16,900 | 1909 | 21,720 | 30.90 | 28,763 |
| 1877 | 11,261 | 25.47 | 17,400 | 1910 ⁴ | 20,625 | | |
| 1878 | 11,300 | 25.74 | 17,700 | 1910 | 20,625 | 33.70 | 28,945 |
| 1879 | 11,826 | 21.71 | 18,900 | 1911 | 20,823 | 38.17 | 28,877 |
| 1880 ⁴ | 12,443 | | | 1912 | 20,699 | 37.62 | 29,183 |
| 1880 | 12,027 | 23.27 | 19,500 | 1913 | 20,497 | 42.99 | 29,836 |
| 1881 | 12,369 | 23.95 | 20,100 | 1914 | 20,737 | 51.51 | 31,601 |
| 1882 | 12,612 | 25.89 | 20,500 | 1915 | 21,262 | 52.84 | 33,381 |
| 1883 | 13,126 | 30.21 | 21,300 | 1916 | 22,108 | 51.49 | 34,392 |
| 1884 | 13,501 | 31.37 | 21,900 | 1917 | 22,894 | 56.95 | 35,727 |
| 1885 | 13,905 | 29.70 | 22,600 | 1918 | 23,310 | 67.37 | 35,467 |
| 1886 | 14,235 | 27.40 | 23,100 | 1919 | 23,475 | 74.68 | 34,481 |
| 1887 | 14,522 | 26.08 | 23,600 | 1920 ⁴ | 19,676 | | |
| 1888 | 14,856 | 24.65 | 24,100 | 1920 | 21,427 | 81.51 | 33,900 |
| 1889 | 15,299 | 23.94 | 24,900 | 1921 | 21,408 | 61.19 | 33,618 |
| 1890 ⁴ | 16,512 | | | 1922 | 21,788 | 48.68 | 33,944 |
| 1890 | 15,953 | 22.14 | 25,900 | 1923 | 22,063 | 48.67 | 34,469 |
| 1891 | 16,020 | 21.62 | 26,100 | 1924 | 22,255 | 49.94 | 34,708 |
| 1892 | 16,416 | 21.40 | 26,900 | 1925 ⁴ | 20,900 | | |
| 1893 | 16,424 | 21.75 | 27,000 | 1925 | 22,481 | 48.39 | 35,188 |
| 1894 | 16,487 | 21.77 | 27,100 | 1926 | 22,188 | 55.02 | 34,329 |
| 1895 | 16,505 | 21.97 | 27,300 | 1927 | 21,801 | 59.58 | 33,992 |
| 1896 | 16,138 | 22.55 | 26,800 | 1928 | 21,824 | 73.93 | 33,475 |
| 1897 | 15,942 | 23.16 | 26,500 | 1929 | 21,820 | 84.59 | 33,853 |

Bureau of Agricultural Economics. Later revised figures for 1928, 1929, and preliminary 1930 may be found in February 1930, Crops and Markets.

¹ Prior to 1920 estimates for each 10-year period represent an index of annual changes applied to the census as a base on first report after census data were available. Figures for 1920 to date are revised estimates of the Bureau of Agricultural Economics for numbers on Jan. 1.

² Values for 1867-1899 relate to "milk cows." Data for 1900-1925 are an old series of values of "milk cows" adjusted to relate to "milk cows and heifers, 2 years old and over" on basis of relationship between the 2 series from 1926 to 1928. Conversion factor was 0.955 (base is old series). Data for 1926-1929 are values relating to "milk cows and heifers 2 years old and over."

³ Data for dairy cattle, including young animals and bulls of that type on farms and elsewhere as of Jan. 1, estimated by the Bureau of Animal Industry. Census figures for milk and dairy cows were adjusted to a Jan. 1 basis and to include all ages and all animals in towns, villages, and ranges, as well as on farms. For methods see Department Circular 241. Revisions have been made by the Bureau of Animal Industry for 1900-1929.

⁴ Italic figures are from the census. Figures for census years 1850-1890 represent "milk cows"; 1900, "cows kept for milk 2 years and over"; 1910, "cows and heifers kept for milk, born before Jan. 1, 1909" (15½ months and over); 1920, "dairy cattle 2 years old and over kept mainly for milk production." For comparison with 1920 the number of dairy cows and heifers 2 years old and over on Jan. 1, 1910, has been estimated by the census as 17,125,471; 1925, number of cows milked. Census dates were June 1 from 1850 to 1900; Apr. 15, 1910; Jan. 1, 1920 and 1925.

⁵ Beginning with 1920, heifers 1 to 2 years old being kept for milk cows were estimated as follows: 1920-1929, respectively, 4,418,000, 4,155,000, 3,968,000, 4,147,000, 4,137,000, 4,195,000, 3,923,000, 4,059,000, 4,201,000, 4,377,000.

⁶ Preliminary.

TABLE 439.—*Milk cows and heifers: Estimated number on farms and value per head, by States, January 1, 1925-1929*

| State and division | Cows and heifers 2 years old and over kept for milk | | | | | | | | | |
|---------------------|---|----------------|----------------|----------------|-------------------|-----------------------------|---------|---------|---------|-------------------|
| | Number | | | | | Value per head ¹ | | | | |
| | 1925 | 1926 | 1927 | 1928 | 1929 ² | 1925 | 1926 | 1927 | 1928 | 1929 ² |
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Dollars | Dollars | Dollars | Dollars | Dollars |
| Maine..... | 156 | 150 | 146 | 139 | 139 | 50.00 | 64.00 | 66.00 | 76.00 | 87.00 |
| New Hampshire..... | 85 | 80 | 77 | 75 | 75 | 56.00 | 72.00 | 80.00 | 100.00 | 113.00 |
| Vermont..... | 287 | 288 | 286 | 286 | 286 | 54.00 | 66.00 | 75.00 | 97.00 | 100.00 |
| Massachusetts..... | 148 | 140 | 136 | 135 | 134 | 74.00 | 86.00 | 98.00 | 125.00 | 130.00 |
| Rhode Island..... | 22 | 22 | 21 | 20 | 21 | 80.00 | 86.00 | 105.00 | 132.00 | 142.00 |
| Connecticut..... | 118 | 116 | 110 | 108 | 109 | 75.00 | 87.00 | 97.00 | 130.00 | 140.00 |
| New York..... | 1,383 | 1,362 | 1,318 | 1,330 | 1,330 | 61.00 | 79.00 | 90.00 | 111.00 | 124.00 |
| New Jersey..... | 123 | 123 | 119 | 122 | 122 | 72.00 | 92.00 | 103.00 | 120.00 | 135.00 |
| Pennsylvania..... | 889 | 862 | 845 | 855 | 855 | 58.00 | 71.00 | 75.00 | 97.00 | 111.00 |
| North Atlantic..... | 3,211 | 3,143 | 3,058 | 3,070 | 3,071 | 60.54 | 75.89 | 84.27 | 105.72 | 117.59 |
| Ohio..... | 964 | 945 | 926 | 917 | 908 | 54.00 | 62.00 | 67.00 | 83.00 | 93.00 |
| Indiana..... | 679 | 672 | 679 | 679 | 693 | 55.00 | 58.00 | 63.00 | 75.00 | 85.00 |
| Illinois..... | 1,049 | 1,039 | 988 | 968 | 949 | 57.00 | 63.00 | 67.00 | 76.00 | 89.00 |
| Michigan..... | 850 | 858 | 841 | 841 | 841 | 58.00 | 64.00 | 70.00 | 87.00 | 99.00 |
| Wisconsin..... | 2,015 | 2,055 | 2,014 | 1,984 | 1,935 | 53.00 | 65.00 | 70.00 | 86.00 | 97.00 |
| Minnesota..... | 1,560 | 1,560 | 1,513 | 1,498 | 1,483 | 49.00 | 57.00 | 57.00 | 72.00 | 85.00 |
| Iowa..... | 1,341 | 1,341 | 1,314 | 1,314 | 1,314 | 56.00 | 61.00 | 64.00 | 76.00 | 86.00 |
| Missouri..... | 835 | 827 | 827 | 827 | 810 | 42.00 | 44.00 | 48.00 | 61.00 | 74.00 |
| North Dakota..... | 520 | 530 | 472 | 463 | 454 | 42.00 | 45.00 | 48.00 | 61.00 | 75.00 |
| South Dakota..... | 644 | 639 | 513 | 518 | 523 | 45.00 | 49.00 | 52.00 | 68.00 | 77.00 |
| Nebraska..... | 625 | 625 | 613 | 613 | 613 | 50.00 | 54.00 | 55.00 | 71.00 | 84.00 |
| Kansas..... | 760 | 730 | 715 | 701 | 701 | 46.00 | 50.00 | 51.00 | 62.00 | 75.00 |
| North Central..... | 11,742 | 11,721 | 11,415 | 11,323 | 11,224 | 51.48 | 57.94 | 61.36 | 75.33 | 86.97 |
| Delaware..... | 34 | 35 | 35 | 36 | 37 | 57.00 | 61.00 | 70.00 | 92.00 | 110.00 |
| Maryland..... | 184 | 182 | 178 | 185 | 187 | 57.00 | 65.00 | 65.00 | 85.00 | 97.00 |
| Virginia..... | 393 | 380 | 357 | 364 | 382 | 39.00 | 40.00 | 44.00 | 58.00 | 70.00 |
| West Virginia..... | 225 | 221 | 207 | 215 | 219 | 38.00 | 41.00 | 45.00 | 65.00 | 75.00 |
| North Carolina..... | 312 | 303 | 297 | 294 | 294 | 37.00 | 39.00 | 45.00 | 59.00 | 64.00 |
| South Carolina..... | 176 | 155 | 150 | 144 | 145 | 34.00 | 33.00 | 39.00 | 47.00 | 55.00 |
| Georgia..... | 354 | 340 | 343 | 343 | 343 | 27.00 | 28.00 | 32.00 | 42.00 | 49.00 |
| Florida..... | 70 | 74 | 78 | 78 | 74 | 46.00 | 42.00 | 38.00 | 37.00 | 40.00 |
| South Atlantic..... | 1,748 | 1,690 | 1,645 | 1,659 | 1,681 | 38.11 | 40.31 | 43.89 | 57.58 | 66.85 |
| Kentucky..... | 473 | 464 | 469 | 493 | 493 | 35.00 | 38.00 | 45.00 | 60.00 | 65.00 |
| Tennessee..... | 462 | 434 | 425 | 438 | 447 | 29.00 | 32.00 | 38.00 | 53.00 | 60.00 |
| Alabama..... | 365 | 340 | 350 | 350 | 354 | 24.00 | 26.00 | 30.00 | 40.00 | 46.00 |
| Mississippi..... | 411 | 379 | 379 | 390 | 390 | 22.00 | 27.00 | 28.00 | 40.00 | 45.00 |
| Arkansas..... | 382 | 374 | 375 | 375 | 382 | 23.00 | 25.00 | 30.00 | 42.00 | 48.00 |
| Louisiana..... | 206 | 200 | 210 | 204 | 208 | 34.00 | 31.00 | 33.00 | 36.00 | 49.00 |
| Oklahoma..... | 582 | 570 | 581 | 610 | 610 | 32.00 | 37.00 | 45.00 | 56.00 | 64.00 |
| Texas..... | 985 | 936 | 936 | 936 | 955 | 30.00 | 30.00 | 41.00 | 57.00 | 61.00 |
| South Central..... | 3,866 | 3,697 | 3,725 | 3,706 | 3,839 | 28.90 | 31.19 | 37.87 | 50.84 | 56.92 |
| Montana..... | 187 | 190 | 181 | 177 | 177 | 46.00 | 50.00 | 51.00 | 63.00 | 79.00 |
| Idaho..... | 160 | 165 | 168 | 170 | 172 | 49.00 | 60.00 | 67.00 | 75.00 | 86.00 |
| Wyoming..... | 66 | 69 | 70 | 72 | 72 | 47.00 | 54.00 | 57.00 | 70.00 | 86.00 |
| Colorado..... | 224 | 224 | 240 | 242 | 244 | 44.00 | 49.00 | 56.00 | 69.00 | 77.00 |
| New Mexico..... | 64 | 64 | 64 | 65 | 65 | 42.00 | 42.00 | 45.00 | 57.00 | 67.00 |
| Arizona..... | 37 | 32 | 35 | 35 | 36 | 68.00 | 70.00 | 75.00 | 85.00 | 95.00 |
| Utah..... | 87 | 88 | 89 | 92 | 97 | 53.00 | 63.00 | 59.00 | 73.00 | 87.00 |
| Nevada..... | 19 | 20 | 20 | 20 | 20 | 58.00 | 72.00 | 75.00 | 85.00 | 98.00 |
| Washington..... | 283 | 275 | 275 | 275 | 280 | 62.00 | 63.00 | 70.00 | 80.00 | 99.00 |
| Oregon..... | 225 | 214 | 214 | 214 | 216 | 58.00 | 60.00 | 61.00 | 72.00 | 88.00 |
| California..... | 579 | 596 | 602 | 614 | 626 | 70.00 | 73.00 | 75.00 | 80.00 | 94.00 |
| Far Western..... | 1,931 | 1,937 | 1,958 | 1,976 | 2,005 | 57.71 | 61.79 | 65.18 | 74.53 | 88.53 |
| United States..... | 22,498 | 22,188 | 21,801 | 21,824 | 21,820 | 48.39 | 55.02 | 59.58 | 73.93 | 84.59 |

Bureau of Agricultural Economics. Estimates of crop reporting board. Later revised figures for 1928, 1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Total value divided by total number and rounded to nearest dollar for States. Division and United States averages not rounded. State figures are new weighted value series not comparable to State figures previously published.

² Preliminary.

TABLE 440.—*Heifers and heifer calves: Estimated number on farms, by States, January 1, 1925-1929*

| State and division | Heifers 1 to 2 years old being kept for milk cows | | | | | Heifer calves under 1 year being kept for milk cows | | | | |
|---------------------|---|----------------|----------------|----------------|-------------------|---|----------------|----------------|----------------|-------------------|
| | 1925 | 1926 | 1927 | 1928 | 1929 ¹ | 1925 | 1926 | 1927 | 1928 | 1929 ¹ |
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands |
| Maine..... | 31 | 31 | 33 | 32 | 34 | 32 | 32 | 34 | 33 | 35 |
| New Hampshire..... | 16 | 15 | 14 | 14 | 15 | 15 | 15 | 14 | 15 | 17 |
| Vermont..... | 46 | 45 | 47 | 49 | 55 | 50 | 48 | 49 | 55 | 59 |
| Massachusetts..... | 19 | 18 | 17 | 17 | 18 | 18 | 19 | 17 | 18 | 20 |
| Rhode Island..... | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| Connecticut..... | 17 | 14 | 15 | 13 | 13 | 17 | 14 | 13 | 13 | 14 |
| New York..... | 182 | 188 | 178 | 197 | 222 | 173 | 183 | 207 | 232 | 237 |
| New Jersey..... | 12 | 12 | 15 | 16 | 17 | 11 | 11 | 15 | 15 | 16 |
| Pennsylvania..... | 129 | 115 | 124 | 136 | 149 | 117 | 130 | 138 | 152 | 175 |
| North Atlantic..... | 454 | 420 | 443 | 477 | 526 | 435 | 454 | 490 | 536 | 576 |
| Ohio..... | 152 | 140 | 160 | 165 | 188 | 170 | 156 | 170 | 193 | 212 |
| Indiana..... | 111 | 105 | 112 | 125 | 135 | 114 | 130 | 137 | 150 | 159 |
| Illinois..... | 189 | 167 | 184 | 175 | 180 | 215 | 195 | 200 | 207 | 213 |
| Michigan..... | 146 | 149 | 153 | 159 | 165 | 190 | 175 | 180 | 182 | 184 |
| Wisconsin..... | 364 | 331 | 345 | 360 | 364 | 410 | 396 | 405 | 399 | 387 |
| Minnesota..... | 306 | 300 | 312 | 324 | 337 | 377 | 365 | 340 | 354 | 376 |
| Iowa..... | 273 | 245 | 245 | 250 | 250 | 250 | 250 | 240 | 240 | 240 |
| Missouri..... | 172 | 169 | 177 | 172 | 169 | 170 | 180 | 180 | 180 | 180 |
| North Dakota..... | 127 | 122 | 98 | 97 | 105 | 139 | 135 | 100 | 98 | 100 |
| South Dakota..... | 127 | 117 | 112 | 112 | 123 | 140 | 133 | 140 | 130 | 130 |
| Nebraska..... | 124 | 131 | 124 | 124 | 126 | 136 | 127 | 120 | 120 | 120 |
| Kansas..... | 148 | 133 | 120 | 125 | 131 | 140 | 140 | 125 | 130 | 137 |
| North Central..... | 2,239 | 2,109 | 2,142 | 2,188 | 2,273 | 2,451 | 2,382 | 2,337 | 2,383 | 2,438 |
| Delaware..... | 5 | 5 | 5 | 5 | 5 | 3 | 4 | 4 | 4 | 4 |
| Maryland..... | 25 | 24 | 25 | 26 | 27 | 23 | 24 | 25 | 27 | 29 |
| Virginia..... | 55 | 48 | 48 | 51 | 56 | 55 | 51 | 52 | 55 | 61 |
| West Virginia..... | 20 | 26 | 27 | 30 | 35 | 29 | 25 | 28 | 36 | 39 |
| North Carolina..... | 56 | 49 | 47 | 50 | 52 | 52 | 60 | 52 | 55 | 57 |
| South Carolina..... | 37 | 30 | 29 | 28 | 28 | 39 | 34 | 31 | 31 | 31 |
| Georgia..... | 84 | 73 | 77 | 77 | 77 | 95 | 85 | 90 | 90 | 84 |
| Florida..... | 15 | 17 | 18 | 19 | 17 | 18 | 18 | 18 | 19 | 18 |
| South Atlantic..... | 306 | 272 | 276 | 289 | 297 | 314 | 301 | 300 | 317 | 323 |
| Kentucky..... | 65 | 61 | 61 | 65 | 69 | 80 | 75 | 75 | 80 | 85 |
| Tennessee..... | 88 | 74 | 103 | 127 | 134 | 95 | 87 | 108 | 122 | 130 |
| Alabama..... | 83 | 77 | 87 | 88 | 90 | 90 | 99 | 87 | 90 | 92 |
| Mississippi..... | 87 | 77 | 82 | 90 | 95 | 94 | 91 | 91 | 99 | 99 |
| Arkansas..... | 91 | 82 | 90 | 92 | 92 | 125 | 100 | 105 | 103 | 101 |
| Louisiana..... | 44 | 37 | 41 | 41 | 42 | 35 | 32 | 32 | 34 | 35 |
| Oklahoma..... | 127 | 101 | 112 | 116 | 116 | 140 | 150 | 180 | 200 | 200 |
| Texas..... | 194 | 194 | 194 | 184 | 184 | 400 | 420 | 220 | 210 | 220 |
| South Central..... | 779 | 703 | 770 | 803 | 822 | 1,069 | 1,054 | 898 | 938 | 962 |
| Montana..... | 36 | 35 | 36 | 35 | 37 | 37 | 37 | 38 | 38 | 41 |
| Idaho..... | 38 | 38 | 40 | 43 | 44 | 40 | 42 | 44 | 48 | 48 |
| Wyoming..... | 14 | 15 | 14 | 15 | 15 | 20 | 21 | 19 | 20 | 20 |
| Colorado..... | 48 | 47 | 48 | 50 | 51 | 58 | 58 | 64 | 61 | 63 |
| New Mexico..... | 11 | 13 | 14 | 14 | 14 | 17 | 18 | 18 | 14 | 14 |
| Arizona..... | 10 | 8 | 10 | 9 | 9 | 13 | 11 | 13 | 13 | 12 |
| Utah..... | 21 | 21 | 21 | 23 | 25 | 22 | 24 | 24 | 26 | 28 |
| Nevada..... | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Washington..... | 57 | 55 | 53 | 58 | 60 | 75 | 72 | 65 | 67 | 68 |
| Oregon..... | 44 | 44 | 44 | 45 | 46 | 50 | 50 | 45 | 47 | 48 |
| California..... | 132 | 137 | 142 | 149 | 152 | 125 | 125 | 130 | 137 | 134 |
| Far Western..... | 417 | 419 | 428 | 447 | 459 | 463 | 464 | 466 | 477 | 482 |
| United States..... | 4,195 | 3,923 | 4,069 | 4,201 | 4,377 | 4,722 | 4,655 | 4,491 | 4,651 | 4,781 |

Bureau of Agricultural Economics. Estimates of crop reporting board. Later revised figures for 1928, 1929, and preliminary 1930 may be found in February, 1930, Crops and Markets.

¹ Preliminary.

TABLE 441.—*Purebred dairy cattle: Number registered, each year, by breeds, United States, 1900-1928*

| Year | Ayrshire | | | Guernsey | | | Holstein-Friesian | | | Jersey | | |
|-----------|----------|-------|--------|----------|--------|--------|-------------------|---------|---------|--------|--------|--------|
| | Bulls | Cows | Total | Bulls | Cows | Total | Bulls | Cows | Total | Bulls | Cows | Total |
| 1900..... | | | | 608 | 896 | 1,504 | 1,365 | 3,381 | 4,746 | 2,798 | 8,750 | 11,548 |
| 1901..... | | | | 647 | 1,172 | 1,819 | 1,469 | 3,648 | 5,108 | 2,567 | 8,045 | 10,612 |
| 1902..... | | | | 726 | 1,267 | 1,993 | 1,738 | 4,252 | 5,990 | 2,471 | 7,580 | 10,051 |
| 1903..... | | | | 746 | 1,289 | 2,035 | 2,088 | 4,753 | 6,841 | 2,370 | 7,240 | 9,610 |
| 1904..... | | | | 737 | 1,261 | 1,998 | 2,477 | 5,567 | 8,044 | 2,373 | 7,464 | 9,837 |
| 1905..... | | | | 847 | 1,612 | 2,459 | 3,226 | 6,547 | 9,773 | 2,640 | 7,735 | 10,375 |
| 1906..... | | | | 950 | 1,904 | 2,914 | 3,842 | 7,918 | 11,760 | 3,019 | 8,652 | 11,671 |
| 1907..... | | | | 1,118 | 1,966 | 3,084 | 4,841 | 9,809 | 14,650 | 3,752 | 9,383 | 13,135 |
| 1908..... | | | | 1,291 | 2,191 | 3,482 | 5,684 | 10,350 | 16,534 | 4,148 | 10,135 | 14,283 |
| 1909..... | | | | 1,841 | 3,836 | 5,677 | 7,021 | 12,570 | 19,591 | 5,249 | 12,513 | 17,762 |
| 1910..... | | 3,233 | | 2,420 | 4,194 | 6,614 | 9,689 | 16,487 | 26,176 | 6,333 | 14,509 | 20,842 |
| 1911..... | | 4,798 | | 2,402 | 4,001 | 6,403 | 12,472 | 20,417 | 32,889 | 7,229 | 16,282 | 23,511 |
| 1912..... | | 2,884 | | 2,042 | 4,578 | 6,620 | 13,743 | 23,792 | 37,535 | 7,562 | 16,591 | 24,153 |
| 1913..... | | 3,950 | | 3,653 | 5,642 | 9,295 | 16,364 | 26,951 | 43,315 | 9,147 | 19,481 | 28,628 |
| 1914..... | | 4,912 | | 4,348 | 6,937 | 11,285 | 18,336 | 29,750 | 48,086 | 10,079 | 22,561 | 32,640 |
| 1915..... | | 4,439 | | 4,765 | 6,535 | 11,300 | 25,617 | 42,063 | 67,680 | 9,475 | 22,957 | 32,432 |
| 1916..... | | 4,033 | | 5,030 | 7,654 | 12,684 | 26,116 | 46,549 | 72,665 | 10,242 | 21,907 | 35,239 |
| 1917..... | | 4,914 | | 6,167 | 9,366 | 15,533 | 24,749 | 49,048 | 73,817 | 14,446 | 33,900 | 48,406 |
| 1918..... | | 8,494 | | 6,108 | 9,356 | 15,464 | 28,730 | 59,549 | 88,279 | 8,904 | 25,398 | 34,302 |
| 1919..... | | 6,148 | | 7,648 | 11,781 | 19,429 | 30,298 | 60,589 | 90,887 | 10,906 | 30,424 | 41,330 |
| 1920..... | | 6,809 | | 7,427 | 11,956 | 19,383 | 36,791 | 77,712 | 114,503 | 11,669 | 32,162 | 43,831 |
| 1921..... | | 5,874 | | 8,036 | 13,971 | 22,007 | 39,585 | 127,850 | 11,213 | 31,123 | 42,336 | |
| 1922..... | 1,565 | 4,816 | 6,381 | 8,065 | 14,007 | 22,072 | 30,631 | 83,141 | 113,772 | 11,651 | 33,801 | 45,452 |
| 1923..... | 1,578 | 5,975 | 7,553 | 9,758 | 16,976 | 26,734 | 29,089 | 86,043 | 115,132 | 12,291 | 38,159 | 50,450 |
| 1924..... | 1,431 | 5,508 | 6,939 | 10,301 | 18,166 | 28,467 | 28,209 | 83,320 | 111,529 | 12,331 | 39,832 | 52,163 |
| 1925..... | 1,561 | 5,972 | 7,533 | 11,290 | 20,742 | 32,041 | 26,935 | 82,659 | 109,594 | 12,131 | 41,725 | 53,856 |
| 1926..... | 1,720 | 6,142 | 7,862 | 12,392 | 22,298 | 34,690 | 28,117 | 82,071 | 111,088 | 12,837 | 42,915 | 55,752 |
| 1927..... | 1,847 | 6,554 | 8,401 | 12,777 | 22,694 | 35,471 | 28,817 | 81,146 | 109,993 | 15,666 | 48,411 | 64,077 |
| 1928..... | 2,274 | 7,837 | 10,111 | 14,363 | 24,664 | 39,027 | 35,512 | 88,214 | 121,726 | 19,393 | 54,516 | 73,909 |
| 1929..... | 2,586 | 8,833 | 11,419 | 14,661 | 26,288 | 40,949 | 34,438 | 89,927 | 125,365 | 19,230 | 52,431 | 71,661 |

Bureau of Agricultural Economics. Obtained from registry associations.

TABLE 442.—*Cattle: Tuberculin testing under accredited-herd and area plans, 1917-1929*

| Year ended June 30— | Cattle tested | | | | | Modified accredited counties | Herds accredited ¹ | Herds passed one test ¹ | Herds under supervision ¹ |
|---------------------|------------------------------|------------|------------|-------------------|----------------------------|------------------------------|-------------------------------|------------------------------------|--------------------------------------|
| | Accred- ited-herd plan | Area plan | Total | Reactors found | Per cent of reactors | | | | |
| | Number | Number | Number | Number | | Number | Number | Number | Number |
| 1917..... | 20,101 | | 20,101 | 645 | 3.2 | | | | |
| 1918..... | 134,143 | | 134,143 | 6,544 | 4.9 | | 204 | 883 | |
| 1919..... | 329,878 | | 329,878 | 13,528 | 4.1 | | 578 | 5,652 | |
| 1920..... | 700,670 | | 700,670 | 28,709 | 4.1 | | 2,588 | 10,064 | |
| 1921..... | 1,366,358 | | 1,366,358 | 53,768 | 3.9 | | 4,831 | 33,215 | 71,806 |
| 1922..... | 1,722,209 | * 662,027 | 2,384,236 | 82,569 | 3.5 | | 4,831 | 111,719 | 140,376 |
| 1923..... | 1,695,662 | 1,765,187 | 3,460,849 | 113,844 | 3.3 | | 8,015 | 150,748 | 187,915 |
| 1924..... | 1,895,863 | 3,446,501 | 5,312,364 | 171,559 | 3.2 | | 38 | 216,737 | 305,809 |
| 1925..... | 2,008,526 | 4,991,502 | 7,000,028 | 214,491 | 3.1 | | 51 | 392,740 | 414,620 |
| 1926..... | 1,989,048 | 6,661,732 | 8,650,780 | 323,084 | 3.7 | | 100 | 382,674 | 435,840 |
| 1927..... | 2,522,791 | 7,177,385 | 9,700,176 | 285,361 | 2.9 | | 149 | 229,066 | 261,148 |
| 1928..... | 2,589,844 | 8,691,646 | 11,281,490 | 262,113 | 2.3 | | 180 | 427,595 | 473,218 |
| 1929..... | 2,853,633 | 8,830,687 | 11,684,320 | 206,764 | 1.8 | | 213 | 281,420 | 281,223 |
| Total..... | 19,798,726 | 42,226,067 | 62,024,793 | 1,762,979 | 2.8 | * 740 | 170,995 | 2,210,533 | 2,572,055 |

Bureau of Animal Industry.

¹ The figures in these columns represent net increases at the close of each year.² Testing during 6 months.³ Not including parts of 3 counties and 30 towns.

TABLE 443.—Cattle: Status of tuberculosis-eradication work, by States, June 30, 1929

| State | Accredited-herd work | | | Eradication from areas ¹ | | | Total tuberculin tests, 1917 to June 30, 1929 | | |
|---|----------------------|-----------------------|-------------------------|-------------------------------------|--|--|---|-----------|----------|
| | Herds accredited | Herds passed one test | Herds under supervision | Modified accredited counties | Counties completing one or more tests of all cattle ² | Total counties engaged in testing ² | Total cattle | Reactors | |
| | | | | | | | | Number | Per cent |
| Alabama..... | 305 | 5,598 | 8,191 | 0 | 0 | 0 | 391,832 | 2,249 | 0.6 |
| Arizona..... | 45 | 8,243 | 8,319 | 0 | 0 | 2 | 262,141 | 6,515 | 2.5 |
| Arkansas..... | 17 | 2,893 | 9,126 | 1 | 1 | 1 | 85,457 | 415 | .5 |
| California..... | 117 | 6,580 | 6,749 | 2 | 5 | 7 | 516,957 | 5,417 | 1.0 |
| Colorado..... | 165 | 947 | 1,450 | 0 | 0 | 1 | 92,455 | 2,088 | 2.3 |
| Connecticut..... | 2,586 | 3,761 | 7,042 | 0 | 0 | 4 | 503,889 | 41,434 | 8.2 |
| Delaware..... | 2,094 | 3,509 | 6,380 | 0 | 1 | 1 | 156,488 | 12,664 | 8.1 |
| District of Columbia..... | 8 | 99 | 107 | 0 | 1 | 1 | 13,324 | 123 | .9 |
| Florida..... | 202 | 7,901 | 8,734 | 0 | 2 | 2 | 323,207 | 3,630 | 1.1 |
| Georgia..... | 27 | 25,463 | 25,496 | 10 | 14 | 17 | 326,533 | 3,127 | 1.0 |
| Idaho..... | 56 | 33,468 | 36,693 | 27 | 27 | 39 | 668,932 | 4,170 | .6 |
| Illinois..... | 5,384 | 142,547 | 160,516 | 43 | 43 | 76 | 4,716,594 | 190,718 | 4.0 |
| Indiana..... | 27,875 | 126,689 | 173,721 | 64 | 65 | 78 | 2,220,744 | 27,781 | 1.2 |
| Iowa..... | 3,157 | 105,640 | 172,700 | 44 | 54 | 64 | 5,905,005 | 148,453 | 2.5 |
| Kansas..... | 836 | 82,717 | 84,094 | 41 | 41 | 47 | 1,308,223 | 11,930 | .9 |
| Kentucky..... | 60 | 71,564 | 73,378 | 18 | 51 | 61 | 650,403 | 5,990 | .9 |
| Louisiana..... | 17 | 8,080 | 8,450 | 0 | 0 | 0 | 330,519 | 6,906 | 2.1 |
| Maine..... | 699 | 43,008 | 43,817 | 16 | 16 | 16 | 674,276 | 7,330 | 1.1 |
| Maryland..... | 7,153 | 15,127 | 28,285 | 1 | 7 | 16 | 820,904 | 52,507 | 6.4 |
| Massachusetts..... | 1,390 | 2,084 | 4,191 | 1 | 1 | 2 | 324,138 | 38,690 | 11.9 |
| Michigan..... | 72 | 166,890 | 169,654 | 65 | 70 | 76 | 3,548,859 | 61,103 | 1.7 |
| Minnesota..... | 9,142 | 79,388 | 92,496 | 24 | 38 | 38 | 4,964,541 | 111,541 | 2.2 |
| Mississippi..... | 27 | 5,205 | 5,232 | 5 | 6 | 7 | 287,484 | 1,441 | .5 |
| Missouri..... | 227 | 71,686 | 75,377 | 9 | 9 | 13 | 7,971,055 | 7,316 | .8 |
| Montana..... | 91 | 31,429 | 31,897 | ³ 11 | ³ 11 | 14 | 848,465 | 6,714 | .8 |
| Nebraska..... | 105 | 67,210 | 67,566 | 37 | 39 | 43 | 2,162,992 | 26,899 | 1.2 |
| Nevada..... | 11 | 1,235 | 1,546 | 0 | 0 | 12 | 151,220 | 2,103 | 1.4 |
| New Hampshire..... | 3,942 | 2,059 | 6,123 | 1 | 1 | 5 | 427,855 | 23,540 | 5.5 |
| New Jersey..... | 2,829 | 3,915 | 9,876 | 0 | 0 | 0 | 384,949 | 24,456 | 6.4 |
| New Mexico..... | 23 | 2,051 | 2,132 | 0 | 0 | 13 | 70,588 | 407 | .6 |
| New York..... | 68,138 | 27,049 | 105,371 | 8 | 10 | 48 | 4,651,855 | 395,258 | 8.5 |
| North Carolina..... | 394 | 256,530 | 257,311 | 100 | 100 | 100 | 811,608 | 3,939 | .5 |
| North Dakota..... | 5,149 | 52,394 | 63,667 | 26 | 30 | 39 | 1,774,278 | 21,860 | 1.2 |
| Ohio..... | 543 | 174,315 | 181,092 | 35 | 44 | 59 | 2,281,691 | 73,682 | 3.2 |
| Oklahoma..... | 288 | 129 | 440 | 0 | 0 | 0 | 214,527 | 3,921 | 1.8 |
| Oregon..... | 405 | 50,970 | 51,457 | 7 | 13 | 27 | 1,108,530 | 12,260 | 1.1 |
| Pennsylvania..... | 5,302 | 105,350 | 123,598 | 20 | 22 | 57 | 2,857,668 | 131,056 | 4.6 |
| Rhode Island..... | 101 | 170 | 419 | 0 | 0 | 0 | 40,959 | 5,148 | 12.6 |
| South Carolina..... | 102 | 59,360 | 59,546 | 12 | 12 | 14 | 282,749 | 1,552 | .5 |
| South Dakota..... | 1,256 | 8,687 | 10,137 | 5 | 5 | 5 | 721,849 | 13,608 | 1.9 |
| Tennessee..... | 169 | 62,028 | 62,328 | 11 | 11 | 12 | 521,383 | 2,665 | .5 |
| Texas..... | 248 | 553 | 912 | 0 | 0 | 0 | 300,574 | 3,708 | 1.2 |
| Utah..... | 99 | 10,724 | 11,563 | 1 | 2 | 24 | 527,572 | 5,058 | 1.0 |
| Vermont..... | 6,844 | 5,495 | 22,343 | (⁴) | (⁴) | 8 | 1,129,460 | 44,581 | 3.9 |
| Virginia..... | 1,277 | 20,639 | 22,187 | 25 | 26 | 33 | 703,772 | 12,817 | 1.8 |
| Washington..... | 86 | 41,589 | 45,300 | ⁵ 9 | ⁵ 12 | 29 | 1,137,395 | 29,728 | 2.6 |
| West Virginia..... | 1,190 | 48,248 | 50,052 | 18 | 20 | 25 | 438,531 | 5,059 | 1.2 |
| Wisconsin..... | 10,678 | 149,349 | 163,688 | 43 | 60 | 65 | 6,825,976 | 148,584 | 2.2 |
| Wyoming..... | 4 | 9,948 | 11,306 | 0 | 0 | 0 | 143,338 | 1,114 | .8 |
| Alaska..... | — | — | — | — | — | — | 1,492 | 38 | 2.5 |
| Hawaii..... | — | — | — | — | — | — | 73,517 | 1,529 | 2.1 |
| Interstate testing..... | — | — | — | — | — | — | 1,361,042 | 7,983 | .6 |
| Indian schools ⁶ | — | — | — | — | — | — | 413 | 27 | 6.5 |
| Purebreds in United States ⁶ | — | — | — | — | — | — | 4,486 | 157 | 3.5 |
| Total..... | 170,995 | 2,210,533 | 2,572,055 | 7740 | 7879 | 1,201 | 62,024,793 | 1,762,979 | 2.8 |

Bureau of Animal Industry.

¹ Accredited-herd work began 1917; area work, 1921.² Including District of Columbia.³ Not including part of 1 county.⁴ Not including 30 towns.⁵ Not including part of 2 counties.⁶ Testing in United States before work organized by States.⁷ Not including parts of 3 counties and 30 towns.

TABLE 444.—Number of dairy-herd improvement associations, 1906-1930

| State | 1906 | 1907 | 1908 | 1909 | 1910 | 1911 | 1912 | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1925 | 1926 | 1927 | 1928 | 1929 | 1930 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|
| Michigan | 1 | 4 | | 5 | 4 | 3 | 4 | 4 | 3 | 3 | 10 | 15 | 7 | 13 | 14 | 11 | 17 | 53 | 105 | 108 | 102 | 105 | 94 | 90 |
| Maine | | | 3 | 2 | 3 | 6 | 5 | 4 | 5 | 8 | 11 | 5 | 1 | 0 | 0 | 0 | 3 | 4 | 2 | 1 | 0 | 0 | 0 | 5 |
| New York | | | 1 | 1 | 3 | 9 | 18 | 21 | 29 | 35 | 47 | 43 | 19 | 25 | 28 | 31 | 27 | 24 | 28 | 36 | 42 | 54 | 51 | |
| Vermont | | | | 2 | 8 | 10 | 11 | 17 | 28 | 33 | 38 | 47 | 18 | 12 | 18 | 17 | 21 | 20 | 17 | 23 | 23 | 25 | 23 | 23 |
| Iowa | | | | 2 | 5 | 4 | 8 | 7 | 8 | 13 | 23 | 30 | 15 | 11 | 14 | 17 | 22 | 47 | 56 | 61 | 77 | 86 | 101 | 101 |
| California | | | | 1 | 3 | 2 | 4 | 4 | 5 | 7 | 9 | 15 | 16 | 14 | 18 | 21 | 21 | 27 | 20 | 30 | 35 | 32 | 32 | 33 |
| Wisconsin | | | | 9 | 10 | 10 | 8 | 11 | 24 | 37 | 51 | 81 | 112 | 105 | 115 | 103 | 127 | 151 | 176 | 169 | 159 | 166 | 154 | 142 |
| Nebraska | | | | 1 | 0 | 0 | 0 | 3 | 2 | 3 | 4 | 4 | 2 | 2 | 0 | 0 | 1 | 4 | 2 | 6 | 10 | 17 | 23 | 28 |
| Colorado | | | | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 3 | 5 | 5 | 5 | 4 | 6 | 6 | 7 | 6 | 5 | 9 | 14 | 15 |
| Pennsylvania | | | | 1 | 1 | 1 | 2 | 2 | 7 | 14 | 19 | 24 | 21 | 35 | 64 | 46 | 45 | 36 | 42 | 43 | 49 | 65 | 76 | 88 |
| Ohio | | | | 1 | 1 | 0 | 0 | 1 | 4 | 5 | 20 | 30 | 24 | 24 | 41 | 35 | 36 | 36 | 21 | 25 | 28 | 29 | 39 | 38 |
| Washington | | | | 1 | 3 | 1 | 0 | 0 | 1 | 1 | 12 | 18 | 11 | 9 | 6 | 10 | 10 | 11 | 10 | 8 | 11 | 10 | 12 | 15 |
| Maryland | | | | 1 | 1 | 3 | 3 | 2 | 4 | 7 | 8 | 4 | 2 | 6 | 7 | 6 | 4 | 9 | 10 | 8 | 7 | 8 | 9 | 9 |
| Illinois | | | | 4 | 3 | 2 | 7 | 3 | 3 | 17 | 15 | 27 | 23 | 25 | 24 | 23 | 24 | 26 | 30 | 34 | 51 | 59 | 51 | 59 |
| Minnesota | | | | | | 3 | 7 | 10 | 9 | 11 | 22 | 26 | 23 | 21 | 19 | 23 | 37 | 55 | 88 | 84 | 85 | 105 | 117 | 120 |
| New Hampshire | | | | | 1 | 1 | 1 | 4 | 8 | 11 | 12 | 8 | 9 | 10 | 10 | 11 | 10 | 5 | 4 | 2 | 4 | 7 | 7 | 7 |
| Oregon | | | | | 1 | 1 | 1 | 7 | 11 | 15 | 17 | 11 | 6 | 9 | 5 | 5 | 4 | 7 | 8 | 9 | 11 | 17 | 14 | 14 |
| Utah | | | | | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 4 | 5 | 4 | 5 | 5 | 5 | 8 |
| Massachusetts | | | | | | 2 | 2 | 2 | 3 | 0 | 4 | 4 | 0 | 0 | 1 | 5 | 6 | 6 | 3 | 6 | 7 | 9 | 11 | 11 |
| Virginia | | | | | | 2 | 2 | 2 | 0 | 0 | 2 | 4 | 4 | 5 | 8 | 10 | 12 | 13 | 15 | 18 | 18 | 20 | 20 | 20 |
| Kansas | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 3 | 15 | 13 | 13 | 9 | 8 | 11 | 13 | 14 | 20 | 22 | 22 |
| Indiana | | | | | | 2 | 2 | 3 | 7 | 9 | 7 | 9 | 7 | 10 | 5 | 10 | 5 | 10 | 17 | 25 | 31 | 34 | 41 | 51 |
| Kentucky | | | | | | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 5 | 5 | 2 | 3 | 2 | 0 | 2 | (1) | 8 | 12 |
| Missouri | | | | | | 2 | 2 | 1 | 2 | 5 | 4 | 5 | 6 | 7 | 11 | 12 | 13 | 19 | 21 | 25 | 34 | 36 | 36 | 36 |
| New Jersey | | | | | | 2 | 3 | 4 | 8 | 9 | 9 | 9 | 12 | 8 | 6 | 6 | 6 | 6 | 9 | 11 | 17 | 18 | 16 | 16 |
| West Virginia | | | | | | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | 5 | 5 | 6 | 3 | 3 | 3 | 4 | 6 | 7 | 7 |
| Connecticut | | | | | | 1 | 3 | 6 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 1 | 2 | 4 | 5 | 3 | 4 | 4 |
| North Carolina | | | | | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 2 | 5 | 5 | 8 | 7 | 7 |
| Louisiana | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 |
| South Dakota | | | | | | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 4 | 11 | 9 | 10 | 8 | 14 | 12 |
| Nevada | | | | | | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 3 | 1 | 3 | 0 | 1 | 0 |
| Arizona | | | | | | | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 4 |
| Rhode Island | | | | | | | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 4 | 3 | 0 | 0 | 0 | 0 | 1 | 1 |
| Delaware | | | | | | | 2 | 3 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Idaho | | | | | | | 2 | 1 | 1 | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 8 | 8 | 8 | 8 | 9 | 12 | 13 | 13 |
| Mississippi | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| Montana | | | | | | | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 3 | 7 | 7 | 8 | 9 |
| Tennessee | | | | | | | 1 | 8 | 4 | 6 | 3 | 3 | 4 | 2 | 2 | 3 | 4 | 2 | 2 | 2 | 2 | 3 | 7 | 10 |
| New Mexico | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 1 |
| Wyoming | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Alabama | | | | | | | 2 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 4 | 7 |
| Georgia | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 |
| North Dakota | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 6 | 8 | 5 | 3 | 6 | 4 | 7 | 9 |
| Oklahoma | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 5 | 5 | 5 | 12 | 22 | 25 |
| South Carolina | | | | | | | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 3 |
| Texas | | | | | | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 6 | 7 |
| Arkansas | | | | | | | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | (1) | 1 | 1 |
| Florida | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Total | 1 | 4 | 6 | 25 | 40 | 64 | 82 | 100 | 163 | 211 | 346 | 459 | 353 | 385 | 468 | 452 | 513 | 627 | 732 | 777 | 837 | 947 | 1,090 | 1,143 |

Bureau of Dairy Industry. Up to and including 1923 data were collected on July 1. Beginning with 1924 reports are made by calendar years. Last 6 columns give data for Jan. 1. ¹ No report

TABLE 445.—Milk cows: Estimated average price ¹ per head received by producers, 15th of month, United States, 1910-1929

| Year | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Average |
|-------|---------|---------|---------|---------|--------|---------|---------|---------|----------|---------|---------|---------|---------|
| | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. | Dolls. |
| 1910. | 41.18 | 40.35 | 41.75 | 42.22 | 42.38 | 43.46 | 42.86 | 42.77 | 42.68 | 43.20 | 43.34 | 43.41 | 42.47 |
| 1911. | 44.70 | 44.48 | 45.42 | 44.81 | 44.54 | 43.86 | 42.44 | 42.26 | 42.22 | 42.69 | 42.70 | 42.72 | 43.47 |
| 1912. | 42.89 | 43.40 | 44.00 | 45.15 | 45.03 | 45.84 | 45.41 | 46.11 | 46.79 | 47.30 | 47.38 | 48.42 | 45.72 |
| 1913. | 40.51 | 51.42 | 54.02 | 55.34 | 54.80 | 55.20 | 54.80 | 54.78 | 55.78 | 56.47 | 57.71 | 57.19 | 54.75 |
| 1914. | 57.99 | 59.09 | 59.23 | 59.60 | 59.85 | 59.82 | 59.67 | 60.72 | 59.58 | 59.53 | 58.77 | 58.23 | 59.34 |
| 1915. | 58.77 | 57.99 | 58.00 | 57.78 | 58.20 | 58.59 | 60.31 | 58.34 | 58.38 | 58.76 | 57.35 | 56.79 | 58.25 |
| 1916. | 57.79 | 57.99 | 59.51 | 60.68 | 60.98 | 61.63 | 62.04 | 61.32 | 61.41 | 62.19 | 62.67 | 63.18 | 60.95 |
| 1917. | 63.92 | 65.93 | 68.46 | 72.09 | 72.78 | 72.87 | 72.81 | 72.53 | 73.93 | 75.79 | 75.00 | 76.16 | 71.86 |
| 1918. | 76.54 | 78.36 | 80.71 | 82.45 | 84.11 | 84.74 | 84.97 | 84.06 | 85.21 | 85.41 | 84.51 | 85.78 | 83.07 |
| 1919. | 88.10 | 86.15 | 88.15 | 90.91 | 93.43 | 93.84 | 94.01 | 94.72 | 93.42 | 93.43 | 93.27 | 95.54 | 91.96 |
| 1920. | 94.42 | 95.27 | 94.94 | 95.36 | 94.56 | 94.56 | 91.23 | 90.50 | 89.40 | 85.90 | 77.56 | 70.42 | 89.51 |
| 1921. | 66.82 | 63.44 | 65.37 | 64.35 | 62.03 | 59.89 | 56.55 | 55.85 | 54.33 | 53.39 | 53.28 | 53.30 | 50.10 |
| 1922. | 52.83 | 53.54 | 54.87 | 54.46 | 54.76 | 54.87 | 54.20 | 52.67 | 52.79 | 52.86 | 51.62 | 53.21 | 53.56 |
| 1923. | 54.01 | 54.15 | 55.29 | 56.14 | 55.91 | 56.34 | 56.22 | 55.45 | 56.13 | 55.51 | 55.39 | 54.66 | 55.43 |
| 1924. | 55.57 | 55.49 | 55.88 | 55.92 | 56.37 | 56.45 | 55.46 | 55.74 | 55.54 | 54.30 | 55.05 | 54.00 | 55.48 |
| 1925. | 54.81 | 54.79 | 56.19 | 56.85 | 57.88 | 57.79 | 57.95 | 58.26 | 58.68 | 60.17 | 60.69 | 60.38 | 57.87 |
| 1926. | 62.66 | 63.41 | 63.17 | 65.65 | 66.63 | 66.74 | 66.68 | 65.37 | 66.12 | 66.26 | 66.91 | 66.74 | 65.51 |
| 1927. | 67.77 | 68.22 | 70.18 | 71.98 | 72.43 | 74.19 | 74.15 | 74.24 | 76.10 | 78.62 | 81.09 | 82.36 | 74.19 |
| 1928. | 83.11 | 86.34 | 87.95 | 88.55 | 89.00 | 89.00 | 90.37 | 90.43 | 92.56 | 92.86 | 93.05 | 92.87 | 89.75 |
| 1929. | 91.54 | 91.77 | 92.80 | 93.55 | 94.94 | 95.29 | 96.34 | 95.28 | 95.55 | 95.12 | 94.48 | 92.61 | 94.10 |

Bureau of Agriculture, Economics. Monthly prices weighted by number of milk cows Jan. 1, by States; yearly price is a straight average of 12 months. ¹ As reported by county dealers.

TABLE 446.—*Dairy products: Quantity produced, 1921-1928*

| Product | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Creamery butter..... | 1,054,938 | 1,153,515 | 1,252,214 | 1,356,080 | 1,361,529 | 1,451,766 | 1,496,495 | 1,487,049 |
| Whey butter (made from whey cream)..... | 2,176 | 2,291 | 1,904 | 1,665 | 1,774 | 2,872 | 1,217 | 1,097 |
| Renovated or process butter..... | 5,877 | 4,448 | 2,802 | 2,813 | 2,519 | 2,505 | 4,286 | 2,716 |
| American cheese: | | | | | | | | |
| Whole milk..... | 261,727 | 282,806 | 308,108 | 324,695 | 347,240 | 335,915 | 307,777 | 335,253 |
| Part skim..... | 1,455 | 2,164 | 2,145 | 2,470 | 2,793 | 2,927 | 3,390 | 2,900 |
| Full skim..... | 1,733 | 2,500 | 2,033 | 1,605 | 3,208 | 1,384 | 1,888 | 3,048 |
| Swiss cheese (including block)..... | 22,678 | 19,983 | 24,555 | 21,844 | 23,457 | 20,883 | 18,141 | 16,718 |
| Bleek and Munster cheese..... | 42,073 | 37,194 | 33,250 | 32,052 | 34,101 | 31,048 | 31,546 | 28,960 |
| Limburger cheese..... | 7,035 | 7,383 | 7,100 | 9,734 | 9,163 | 9,639 | 8,842 | 7,437 |
| Cream and Neufchatel cheese..... | 9,270 | 9,936 | 10,334 | 14,945 | 17,575 | 18,192 | 25,962 | 30,589 |
| All Italian varieties of cheese..... | 3,793 | 2,627 | 2,132 | 1,973 | 1,562 | 2,425 | 3,377 | 3,587 |
| All other varieties of cheese..... | 6,065 | 5,387 | 5,040 | 4,622 | 4,325 | 5,003 | 5,763 | 9,027 |
| Cottage, pot, and bakers' cheese..... | 27,316 | 32,389 | 35,527 | 54,317 | 59,485 | 67,977 | 75,679 | 87,525 |
| Condensed milk (sweetened): | | | | | | | | |
| Case goods— | | | | | | | | |
| Skimmed..... | 3,861 | 3,915 | 2,748 | 2,044 | 3,135 | 1,298 | 1,623 | 1,366 |
| Unskimmed..... | 199,685 | 230,456 | 196,058 | 187,281 | 186,807 | 154,944 | 161,355 | 139,077 |
| Bulk goods— | | | | | | | | |
| Skimmed..... | 66,051 | 76,049 | 102,236 | 96,581 | 114,198 | 147,473 | 143,722 | 154,723 |
| Unskimmed..... | 22,324 | 30,292 | 44,860 | 47,429 | 44,758 | 55,737 | 39,698 | 38,660 |
| Total condensed milk..... | 292,221 | 340,712 | 345,902 | 333,335 | 348,898 | 359,452 | 346,368 | 333,426 |
| Evaporated milk (unsweet- ened): | | | | | | | | |
| Case goods— | | | | | | | | |
| Skimmed..... | 1,405 | 3,574 | 7,035 | 11,555 | 5,994 | 11,985 | 8,100 | 10,618 |
| Unskimmed..... | 1,028,172 | 949,909 | 1,252,520 | 1,189,755 | 1,202,456 | 1,158,476 | 1,273,815 | 1,237,022 |
| Bulk goods— | | | | | | | | |
| Skimmed..... | 69,220 | 67,066 | 77,416 | 83,131 | 86,954 | 116,758 | 126,085 | 147,625 |
| Unskimmed..... | 73,145 | 70,088 | 92,008 | 82,772 | 113,556 | 86,833 | 101,354 | 89,335 |
| Total evaporated milk..... | 1,171,942 | 1,090,637 | 1,428,979 | 1,367,213 | 1,408,960 | 1,374,052 | 1,509,354 | 1,584,601 |
| Condensed or evaporated buttermilk..... | 29,314 | 44,343 | 54,833 | 66,837 | 77,079 | 86,687 | 99,180 | 102,452 |
| Dried or powdered buttermilk..... | 7,708 | 9,007 | 13,032 | 18,058 | 20,246 | 31,378 | 38,435 | 45,502 |
| Powdered whole milk..... | 4,242 | 5,599 | 6,560 | 7,887 | 8,931 | 19,768 | 11,464 | 9,605 |
| Powdered skimmed milk..... | 38,546 | 40,617 | 62,251 | 69,219 | 73,317 | 91,718 | 118,123 | 147,996 |
| Powdered cream..... | 130 | 118 | 338 | 1,018 | 339 | 331 | 338 | 673 |
| Dried casein (skim milk or buttermilk product)..... | 8,076 | 6,927 | 14,548 | 20,759 | 16,660 | 16,953 | 18,033 | 22,151 |
| Malted milk..... | 15,652 | 13,659 | 15,331 | 15,889 | 18,050 | 20,673 | 22,116 | 21,128 |
| Milk sugar (crude)..... | 2,890 | 2,191 | 2,872 | 3,331 | 5,655 | 4,476 | 4,077 | 5,323 |
| Ice cream of all kinds (gallons)..... | 147,949 | 161,609 | 173,412 | 181,564 | 214,382 | 215,248 | 226,756 | 232,185 |

Bureau of Agricultural Economics. Compiled from reports of factories made direct to the bureau.

NOTE.—A table similar to Table 428, 1927 Yearbook, milk production and utilization, is omitted.

TABLE 447.—*Dairy products: Quantity produced 1928, by months*

| Manufactured product | Total, 1928 | January | February | March | April | May | June | July | August | Septem- ber | October | Novem- ber | Decem- ber |
|---------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> |
| Creamery butter | 1,457,049 | 101,045 | 99,394 | 111,777 | 118,840 | 158,294 | 181,037 | 167,401 | 145,430 | 119,499 | 105,894 | 87,745 | 92,484 |
| Whay butter (made from whey cream) | 1,067 | 106 | 106 | 75 | 91 | 117 | 180 | 105 | 101 | 89 | 103 | 82 | 74 |
| Renovated or process butter | 2,716 | 232 | 174 | 246 | 175 | 236 | 199 | 225 | 273 | 231 | 234 | 252 | 239 |
| <i>American cheese:</i> | | | | | | | | | | | | | |
| Whole milk: | 335,253 | 18,010 | 19,005 | 23,451 | 28,221 | 37,324 | 45,012 | 40,072 | 34,229 | 30,342 | 25,134 | 18,013 | 16,440 |
| Part skim: | 2,900 | 208 | 188 | 276 | 302 | 364 | 322 | 272 | 177 | 153 | 178 | 193 | 232 |
| Full skim: | 3,048 | 220 | 236 | 552 | 720 | 702 | 2,835 | 2,785 | 2,035 | 197 | 146 | 309 | 269 |
| Swiss cheese (including block) | 16,718 | 225 | 224 | 552 | 720 | 2,101 | 2,835 | 2,785 | 2,402 | 2,094 | 1,756 | 813 | 286 |
| Brick and Munster cheese | 29,960 | 2,126 | 2,135 | 1,718 | 2,693 | 2,979 | 3,060 | 2,412 | 2,062 | 2,206 | 2,315 | 2,419 | 2,429 |
| Limburger cheese | 7,437 | 443 | 453 | 552 | 454 | 873 | 929 | 804 | 639 | 701 | 647 | 499 | 2,383 |
| Cream and Neuchatel cheese | 30,589 | 2,700 | 2,711 | 2,791 | 2,482 | 2,617 | 2,384 | 2,312 | 2,212 | 2,210 | 2,578 | 2,703 | 2,683 |
| All other varieties | 3,387 | 295 | 295 | 380 | 365 | 351 | 309 | 271 | 248 | 261 | 283 | 239 | 280 |
| All other varieties | 9,027 | 754 | 784 | 825 | 740 | 535 | 830 | 697 | 714 | 733 | 783 | 697 | 635 |
| Cottage, pot, and bakers' cheese | 87,525 | 6,971 | 6,793 | 8,017 | 7,986 | 9,041 | 8,435 | 7,390 | 6,894 | 6,612 | 6,650 | 6,386 | 6,350 |
| <i>Condensed milk (sweetened):</i> | | | | | | | | | | | | | |
| Skimmed | 1,366 | 103 | 87 | 80 | 149 | 109 | 109 | 115 | 77 | 109 | 172 | 54 | 151 |
| Unskimmed | 133,077 | 11,401 | 12,279 | 14,395 | 13,820 | 12,963 | 11,427 | 11,109 | 12,257 | 11,970 | 9,632 | 6,608 | 10,973 |
| <i>Bulk goods—</i> | | | | | | | | | | | | | |
| Skimmed | 154,723 | 10,118 | 10,400 | 13,415 | 15,430 | 20,361 | 24,291 | 14,043 | 10,694 | 11,425 | 8,437 | 6,670 | 9,430 |
| Unskimmed | 38,060 | 3,334 | 2,842 | 3,641 | 2,930 | 4,916 | 6,514 | 2,731 | 2,116 | 2,515 | 2,879 | 2,053 | 2,239 |
| <i>Evaporated milk (unsweetened):</i> | | | | | | | | | | | | | |
| Skimmed | 10,618 | 8 | 10 | 13 | 3,114 | 3,336 | 3,925 | 142,009 | 107,956 | 94,966 | 82,968 | 67,584 | 77,540 |
| Unskimmed | 1,337,022 | 88,582 | 97,816 | 116,293 | 125,380 | 154,344 | 179,584 | 179,584 | 179,584 | 179,584 | 179,584 | 179,584 | 179,584 |
| <i>Bulk goods—</i> | | | | | | | | | | | | | |
| Skimmed | 147,625 | 9,467 | 10,154 | 12,210 | 11,842 | 15,460 | 16,714 | 17,870 | 16,225 | 12,723 | 9,068 | 7,786 | 8,126 |
| Unskimmed | 80,336 | 4,698 | 5,002 | 6,333 | 8,473 | 11,337 | 12,644 | 9,980 | 9,025 | 6,080 | 5,682 | 4,535 | 4,347 |
| Concentrated skim milk, feed | 20,982 | 1,550 | 1,600 | 2,613 | 3,338 | 3,961 | 2,229 | 1,371 | 983 | 882 | 838 | 732 | 884 |
| Condensed or evaporated buttermilk | 102,452 | 6,213 | 6,263 | 6,880 | 7,544 | 11,541 | 13,643 | 11,862 | 10,408 | 8,776 | 7,308 | 5,863 | 6,121 |
| Dried or powdered buttermilk | 43,502 | 3,121 | 3,312 | 3,706 | 3,587 | 4,726 | 5,365 | 4,862 | 4,337 | 3,381 | 3,077 | 2,727 | 2,968 |
| Powdered whole milk | 9,007 | 608 | 742 | 744 | 634 | 1,209 | 2,076 | 1,694 | 805 | 620 | 277 | 185 | 120 |
| Powdered skim milk | 147,956 | 10,459 | 10,618 | 13,008 | 14,862 | 17,856 | 18,856 | 13,644 | 10,491 | 9,880 | 9,437 | 8,398 | 10,341 |
| Powdered cream | 19 | 33 | 139 | 8 | 139 | 170 | 6 | 6 | 32 | 32 | 14 | 3 | 14 |
| Dried casein | 22,151 | 1,352 | 1,438 | 1,900 | 2,411 | 2,761 | 2,916 | 2,399 | 1,910 | 1,882 | 1,228 | 938 | 1,193 |
| Malted milk | 11,123 | 1,769 | 1,842 | 2,166 | 2,068 | 2,241 | 2,162 | 1,391 | 1,391 | 1,445 | 1,536 | 1,450 | 1,304 |
| Milk sugar (crude) | 5,323 | 342 | 360 | 440 | 617 | 650 | 722 | 479 | 360 | 307 | 367 | 247 | 368 |
| Ice cream of all kinds (gallons) | 232,185 | 9,290 | 9,843 | 13,500 | 16,226 | 25,625 | 29,306 | 38,283 | 33,026 | 20,538 | 14,715 | 10,435 | 9,408 |

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TABLE 448.—*Fluid milk and fluid cream: Receipts at New York, by State of origin, 1927-1929, and by months, 1929*
[40-quart units]¹

| State of origin | 1927 | 1928 | Total | January | February | March | April | May | June | July | August | September | October | November | December |
|-----------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | | | | | | | | | | | | | | |
| Fluid milk | | | | | | | | | | | | | | | |
| Connecticut | 162,613 | 82,720 | 125,800 | 6,624 | 9,174 | 9,584 | 8,086 | 13,709 | 13,105 | 7,498 | 4,882 | 10,516 | 14,068 | 14,958 | 13,666 |
| Massachusetts | 131,577 | 126,443 | 109,432 | 8,765 | 8,175 | 8,301 | 11,742 | 12,851 | 12,322 | 9,517 | 7,610 | 8,489 | 7,943 | 6,766 | 6,971 |
| Maryland | 43,632 | 66,164 | 139,230 | 15,369 | 13,319 | 13,319 | 11,328 | 8,296 | 8,179 | 8,291 | 8,127 | 8,973 | 11,985 | 16,078 | 15,320 |
| New Jersey | 2,051,503 | 1,700,809 | 1,350,818 | 118,566 | 127,575 | 127,575 | 126,753 | 132,902 | 126,988 | 109,791 | 94,860 | 95,783 | 104,526 | 101,066 | 105,543 |
| New York | 27,521,242 | 27,068,784 | 26,748,404 | 2,144,169 | 1,957,166 | 2,232,858 | 2,142,063 | 2,234,858 | 2,364,100 | 2,361,260 | 2,311,941 | 2,330,918 | 2,313,055 | 2,166,420 | 2,189,606 |
| Ohio | | 6,090 | | | | | | | | | | | | 162 | |
| Pennsylvania | 3,652,306 | 4,408,724 | 4,850,724 | 403,771 | 372,613 | 384,744 | 348,036 | 386,416 | 397,616 | 373,723 | 384,783 | 398,526 | 442,535 | 491,14 | 466,178 |
| Vermont | 889,847 | 1,068,937 | 1,321,577 | 91,577 | 81,181 | 101,663 | 103,803 | 108,646 | 120,075 | 140,219 | 131,200 | 115,678 | 110,616 | 11,49 | 105,744 |
| Canada | | | 32,553 | | | 170 | 3,397 | 137 | | 100 | 83 | 6,435 | 7,936 | | 6,526 |
| Other | 1,386 | 2,229 | | | | | | | | | | | | | |
| Total | 34,454,116 | 34,554,791 | 34,714,131 | 2,806,083 | 2,560,870 | 2,878,214 | 2,756,077 | 2,897,805 | 3,042,385 | 3,010,399 | 2,943,606 | 2,973,841 | 3,014,080 | 2,908,554 | 2,909,554 |
| Fluid cream | | | | | | | | | | | | | | | |
| Arkansas | | | 4,753 | | | | | | | | | | | | |
| Connecticut | 114 | 282 | 2,929 | | 203 | 1,078 | 854 | 609 | 603 | 600 | 603 | 608 | 490 | | 642 |
| Delaware | | 96 | | | | | | | | | | | | | |
| Illinois | 953 | 2,638 | 400 | | 1,200 | 1,225 | 1,475 | 2,273 | 2,000 | 1,000 | 1,050 | | 320 | | 72 |
| Indiana | 2,935 | 7,794 | 12,517 | 200 | 400 | 200 | 1,526 | 200 | 600 | 800 | 417 | | | | |
| Iowa | 10,962 | 23,117 | 4,343 | 400 | 400 | | | | | | | | | | |
| Kansas | | | 600 | 200 | | | | | | | | | | | |
| Kentucky | | 200 | 8,500 | | 810 | 1,041 | 634 | 1,250 | 419 | 1,335 | 604 | 863 | 834 | | |
| Massachusetts | 2,510 | 2,434 | 3,394 | 365 | 335 | 430 | 114 | 119 | 217 | 399 | 284 | 177 | 255 | | 529 |
| Maryland | | 613 | 1,077 | 57 | 136 | 120 | | | 50 | | 75 | | 60 | | 35 |
| Michigan | | 2,020 | 200 | | | | | | | | | | | | |
| Minnesota | 4,813 | 2,620 | 13,072 | 788 | 600 | 1,600 | 2,200 | 1,000 | 800 | 1,600 | 1,600 | 1,017 | 200 | | 817 |
| Missouri | 7,568 | 11,599 | | 908 | 406 | | | 405 | 1,167 | 1,200 | 200 | 800 | 200 | | 400 |
| New Jersey | 39,990 | 41,900 | 15,949 | 1,130 | 1,511 | 1,702 | 1,288 | 2,078 | 2,814 | 1,038 | 705 | 873 | 1,016 | | 1,088 |
| New York | 1,192,527 | 1,283,635 | 1,323,875 | 82,940 | 84,308 | 109,965 | 118,195 | 141,632 | 166,240 | 129,538 | 110,407 | 108,170 | 102,016 | | 87,511 |
| Ohio | 1,800 | 1,110 | 23,092 | 1,150 | 1,866 | 1,898 | 1,823 | 2,284 | 4,602 | 4,410 | 2,178 | 811 | 543 | | 1,175 |
| Pennsylvania | 197,678 | 183,852 | 246,430 | 17,062 | 16,306 | 19,158 | 23,979 | 32,338 | 29,438 | 23,865 | 18,484 | 18,508 | 345 | | 14,841 |
| Tennessee | | 7,767 | 16,446 | 1,708 | 1,722 | 1,700 | 1,588 | 1,650 | 1,278 | 2,348 | 2,348 | 1,085 | 348 | | 217 |
| Virginia | | 33 | | | | | | | | | | | | | |
| Vermont | 73,738 | 96,800 | 71,267 | 3,536 | 3,433 | 5,341 | 5,602 | 8,332 | 9,862 | 8,062 | 6,776 | 5,906 | 4,452 | | 6,132 |
| Wisconsin | 24,720 | 34,524 | 3,075 | 3,797 | 3,797 | 2,400 | 1,939 | 1,843 | 2,409 | 1,802 | 4,610 | 4,046 | 3,526 | | 2,055 |
| Canada | 10,857 | 4,908 | 36,035 | 186 | 127 | 1,182 | 2,302 | 3,640 | 5,890 | 6,372 | 5,355 | 4,582 | 3,065 | | 1,306 |
| Texas | | | 424 | | | | | | | | | | | 200 | 224 |
| Total | 1,571,375 | 1,702,659 | 1,826,916 | 113,705 | 117,160 | 149,083 | 163,644 | 200,319 | 228,638 | 194,906 | 156,079 | 148,881 | 130,680 | 117,134 | 117,134 |

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¹ 40-quart units equal 10 gallons, or about 88 pounds for milk and about 82.5 pounds for cream.

TABLE 449.—*Fluid milk and fluid cream: Receipts at Philadelphia by State of origin—1929*
 [40 quart units]¹

| State of origin | 1929 | | | | | | | | | | | | |
|---------------------------|-----------|---------|----------|---------|---------|---------|---------|---------|---------|-----------|---------|----------|----------|
| | Total | January | February | March | April | May | June | July | August | September | October | November | December |
| Fluid milk | | | | | | | | | | | | | |
| Delaware..... | 652,876 | 55,468 | 50,326 | 56,629 | 60,854 | 66,036 | 58,452 | 50,932 | 50,120 | 49,143 | 51,560 | 48,519 | 54,837 |
| Indiana..... | 17,028 | | | | | | | | | 6,599 | 2,947 | 3,643 | 1,899 |
| Maryland..... | 957,363 | 78,996 | 69,244 | 78,677 | 75,996 | 81,506 | 90,431 | 80,866 | 81,711 | 94,329 | 78,689 | 73,926 | 70,823 |
| New Jersey..... | 579,825 | 61,545 | 52,981 | 50,646 | 45,890 | 54,409 | 53,147 | 45,875 | 43,013 | 43,188 | 44,580 | 42,597 | 41,954 |
| New York..... | 6,354 | | | | | | | 3,212 | 3,142 | | | | |
| Ohio..... | 3,104 | | | | | | | | | 2,404 | 700 | | |
| Pennsylvania..... | 5,143,314 | 386,611 | 388,180 | 447,786 | 429,184 | 438,328 | 439,365 | 435,725 | 430,139 | 415,186 | 453,567 | 433,497 | 445,716 |
| Virginia..... | 1,607 | | | | | | | 600 | 600 | 407 | | | |
| West Virginia..... | 72,969 | 5,320 | 4,363 | 4,353 | 4,674 | 6,519 | 6,521 | 7,526 | 6,105 | 6,185 | 8,572 | 8,237 | 4,444 |
| Wisconsin..... | 720 | | | | | | | | | 620 | 100 | | |
| Total..... | 7,435,060 | 587,940 | 565,124 | 638,091 | 616,598 | 646,798 | 647,946 | 624,736 | 614,830 | 618,061 | 640,725 | 614,439 | 619,773 |
| Fluid cream | | | | | | | | | | | | | |
| Arkansas..... | 1,813 | | | | | 406 | 803 | 400 | | 204 | | | |
| Delaware..... | 2,777 | 34 | 155 | 204 | 314 | 655 | 647 | 80 | 185 | 80 | 233 | | 190 |
| Illinois..... | 4,341 | 425 | 3,434 | 5,003 | 4,429 | 4,500 | 140 | 100 | 302 | 1,617 | | 200 | 200 |
| Indiana..... | 59,026 | 3,703 | 3,434 | 5,003 | 4,429 | 4,574 | 4,479 | 6,706 | 6,280 | 5,340 | 4,564 | 5,404 | 4,810 |
| Iowa..... | 3,753 | 623 | 200 | 400 | 700 | | 830 | 800 | 200 | | | | |
| Kansas..... | 2,000 | 200 | 400 | 400 | 400 | 400 | 200 | | | 400 | | | |
| Kentucky..... | 4,220 | 400 | 600 | 366 | 200 | 204 | 5,039 | 3,451 | 3,014 | 2,089 | 3,955 | 3,266 | 650 |
| Maryland..... | 38,947 | 1,692 | 1,838 | 2,190 | 2,974 | 5,230 | 5,039 | 5,400 | 5,800 | 8,300 | 4,200 | 1,200 | 4,200 |
| Michigan..... | 2,406 | 1,400 | 206 | 206 | | 4,440 | 6,800 | 5,400 | | 200 | 200 | 907 | 100 |
| Minnesota..... | 53,810 | 2,220 | 2,040 | 6,346 | 6,964 | | | | | | | | |
| Mississippi..... | 400 | | | | | | | | | | | | |
| Missouri..... | 27,041 | 862 | 1,897 | 2,009 | 3,283 | 5,989 | 3,724 | 3,642 | 2,277 | 2,251 | 200 | 15 | 84 |
| New Jersey..... | 2,090 | 279 | 275 | 636 | 377 | 390 | | 19 | | | | | |
| New York..... | 50 | | 50 | | | | | | | | | | |
| Ohio..... | 33,847 | 4,662 | 2,422 | 3,473 | 2,400 | 2,362 | 2,200 | 4,141 | 3,948 | 3,573 | 2,065 | 1,300 | 1,271 |
| Oklahoma..... | 1,673 | | 225 | 400 | 400 | | | 200 | | | | 224 | 200 |
| Pennsylvania..... | 48,167 | 3,382 | 2,572 | 2,762 | 4,229 | 7,023 | 6,796 | 6,644 | 4,574 | 2,312 | 3,320 | 1,964 | 2,589 |
| Tennessee..... | 3,221 | 400 | | | | | 418 | | 200 | 405 | 300 | 398 | 1,200 |
| Texas..... | 1,318 | | | 200 | | 427 | | | | | | 250 | |
| Virginia..... | 16,991 | 498 | 267 | 583 | 611 | 2,689 | 2,618 | 2,606 | 2,726 | 1,114 | 630 | 796 | 1,553 |
| West Virginia..... | 476 | | | | | 134 | | | | | | | 342 |
| Wisconsin..... | 86,589 | 4,312 | 4,709 | 7,196 | 9,603 | 6,005 | 7,791 | 11,107 | 11,780 | 9,667 | 5,898 | 4,991 | 3,530 |
| District of Columbia..... | | | | | | | | | | | | | |
| Total..... | 394,856 | 25,092 | 21,284 | 31,675 | 37,690 | 41,944 | 43,001 | 45,714 | 41,727 | 38,152 | 25,510 | 22,115 | 20,953 |

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40-quart units equal 10 gallons, or about 86 pounds for milk and 82.5 pounds for cream.

TABLE 450.—*Condensed and evaporated milk: International trade, average 1909–1913, annual 1925–1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Average 1909–1913 | | 1925 | | 1926 | | 1927 | | 1928 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Netherlands..... | 1 23 | 55 | 288 | 248, 676 | 389 | 203, 046 | 278 | 324, 800 | 359 | 354, 572 |
| United States..... | 1 2 3 | 16, 200 | 4, 621 | 147, 763 | 1, 663 | 114, 549 | 2, 623 | 103, 028 | 2, 609 | 115, 551 |
| Denmark..... | 1 2 3 | 4, 724 | 56 | 58, 762 | 2 | 56, 734 | 14 | 53, 304 | 0 | 52, 598 |
| Switzerland..... | 201 | 80, 539 | 68 | 67, 555 | 71 | 73, 940 | 11 | 81, 234 | 14 | 82, 252 |
| Canada..... | 259 | 4, 575 | 119 | 40, 614 | 152 | 21, 775 | 126 | 33, 680 | 137 | 27, 118 |
| Australia..... | 4, 463 | 727 | 1 42 | 19, 951 | 1 130 | 31, 217 | 1 96 | 16, 025 | --- | --- |
| Norway..... | 3 | 32, 106 | 1, 173 | 16, 848 | 1, 055 | 24, 483 | 747 | 16, 698 | 650 | 18, 747 |
| Italy..... | 806 | 5, 913 | 771 | 17, 322 | 715 | 11, 073 | 1, 335 | 8, 905 | 1, 719 | 7, 092 |
| Irish Free State..... | 0 | 0 | 2, 442 | 6, 569 | 1, 659 | 9, 160 | 1, 494 | 6, 302 | 1, 282 | 10, 746 |
| New Zealand..... | 261 | 132 | 93 | 1, 144 | 7 | 1, 225 | 3 | 1, 557 | 3 | 1, 367 |
| Lithuania..... | 0 | 0 | 1 | 1, 938 | 1 62 | 5, 782 | 1 83 | 8, 888 | 0 | 12, 655 |
| Czechoslovakia..... | 0 | 0 | 759 | 1, 138 | 421 | 640 | 141 | 315 | 227 | 2, 754 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 121, 175 | 48, 221 | 250, 572 | 14, 497 | 269, 682 | 14, 287 | 283, 789 | 27, 771 | 290, 039 | 24, 878 |
| Cuba..... | 28, 457 | 0 | 47, 316 | 0 | 48, 567 | 0 | 50, 586 | 0 | --- | --- |
| Germany ¹ | 2, 468 | 12, 080 | 28, 372 | 1, 428 | 12, 036 | 1, 681 | 13, 434 | 980 | 13, 260 | 1, 477 |
| France..... | 4, 140 | 17, 469 | 4, 803 | 15, 551 | 7, 607 | 11, 209 | 9, 454 | 13, 126 | 13, 908 | --- |
| Dutch East Indies..... | 13 11 049 | 89 | 20, 009 | 0 | 24, 301 | 0 | 26, 149 | 0 | 11, 179 | 0 |
| Philippine Islands..... | 12 311 | 0 | 22, 533 | 0 | 24, 142 | 0 | 25, 974 | 0 | 26, 524 | 0 |
| Japan..... | 10 061 | 0 | 9, 429 | 284 | 9, 641 | 213 | 9, 510 | 399 | 8, 411 | 3, 492 |
| British India..... | 11 236 | 0 | 14, 124 | 0 | 18, 980 | 0 | 21, 933 | 0 | 26, 351 | 0 |
| Union of South Africa..... | 21 227 | 0 | 9, 922 | 16 | 11, 122 | 16 | 11, 330 | 20 | 12, 020 | 19 |
| China..... | 4, 184 | 0 | 10, 117 | 0 | 11, 994 | 0 | 11, 095 | 0 | 14, 643 | 0 |
| Peru..... | 1 2 2, 038 | 0 | 9, 350 | 0 | 8, 886 | 0 | 7, 629 | 0 | 8, 414 | 0 |
| Austria..... | 1 2 323 | 1 6 79 | 1, 154 | 27 | 1, 358 | 64 | 1, 105 | 254 | 1, 205 | 305 |
| Greece..... | 1 176 | 1 0 | 5, 359 | 0 | 5, 111 | 0 | 7, 052 | 0 | 8, 203 | 0 |
| Indo-China..... | 1 2 437 | 1 72 | 4, 388 | 191 | 5, 095 | 252 | 5, 955 | 174 | 7, 603 | --- |
| Siam ² | 0 | 0 | 4, 833 | 0 | 4, 788 | 0 | 6, 617 | 0 | --- | --- |
| Jamaica ¹ | 2, 860 | 0 | 3, 387 | 0 | 3, 803 | 0 | 4, 103 | 0 | --- | --- |
| Belgium ¹ | 0 | 0 | 4, 260 | 1, 096 | 3, 370 | 1, 312 | 2, 915 | 2, 615 | 3, 698 | 3, 512 |
| Trinidad and Tobago..... | 1 37 | 0 | 2, 383 | 0 | 2, 836 | 0 | 3, 132 | 0 | --- | --- |
| Algeria..... | 1 143 | 1 38 | 3, 047 | 66 | 2, 725 | 229 | 3, 682 | 1 129 | --- | --- |
| Tunis..... | 1 2 1, 334 | 0 | 1, 844 | 0 | 1, 828 | 0 | 2, 644 | 0 | --- | --- |
| Poland..... | 0 | 0 | 442 | 128 | 79 | 2 | 263 | 22 | 461 | 18 |
| Egypt..... | 1 1 628 | 0 | 1, 173 | 253 | 1, 339 | 289 | 1, 395 | 351 | 1, 347 | 368 |
| Argentina..... | 742 | 0 | 1, 187 | 5 | 1, 524 | 13 | 1, 446 | 28 | --- | --- |
| Brazil..... | 8, 694 | 0 | 761 | 0 | 1, 838 | 0 | 1, 947 | 0 | --- | 0 |
| Total, 36 countries..... | 250, 957 | 209, 690 | 483, 753 | 651, 171 | 495, 822 | 672, 598 | 524, 934 | 698, 933 | 462, 550 | 733, 450 |

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¹ International Yearbook of Agricultural Statistics.² 4-year average.³ Includes some powdered milk.⁴ 3-year average.⁵ Java and Madura only.⁶ Average for Austria-Hungary.⁷ Figures for Siam are for 12 months ended Mar. 31 of the year following year shown.⁸ 1 year only.TABLE 451.—*Milk, wholesale: Estimated average price per 100 pounds received by producers, United States, 1923–1929*

| Year | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> | <i>Dolls.</i> |
| 1923..... | --- | --- | --- | --- | --- | --- | --- | --- | 2.81 | 2.98 | 3.02 | 2.92 |
| 1924..... | 2.86 | 2.84 | 2.75 | 2.50 | 2.40 | 2.40 | 2.29 | 2.18 | 2.35 | 2.43 | 2.45 | 2.55 |
| 1925..... | 2.48 | 2.55 | 2.62 | 2.48 | 2.47 | 2.47 | 2.45 | 2.55 | 2.56 | 2.73 | 2.69 | 2.65 |
| 1926..... | 2.74 | 2.68 | 2.56 | 2.46 | 2.39 | 2.35 | 2.40 | 2.37 | 2.47 | 2.46 | 2.60 | 2.61 |
| 1927..... | 2.68 | 2.64 | 2.55 | 2.58 | 2.51 | 2.44 | 2.40 | 2.36 | 2.48 | 2.55 | 2.56 | 2.64 |
| 1928..... | 2.67 | 2.69 | 2.61 | 2.51 | 2.49 | 2.45 | 2.45 | 2.48 | 2.56 | 2.60 | 2.63 | 2.65 |
| 1929..... | 2.64 | 2.64 | 2.63 | 2.59 | 2.53 | 2.47 | 2.46 | 2.50 | 2.52 | 2.55 | 2.60 | 2.60 |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by number of milk cows Jan. 1. Prices quoted are to dealers, factories, etc.

TABLE 452.—*Milk, standard or grade B: Retail price per quart, delivered to family trade, New York, Chicago, New Orleans, and San Francisco, 1920-1929*

| Market and year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| New York: | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1920..... | 18 | 16½ | 16½ | 15 | 15 | 15 | 16 | 17 | 18 | 18 | 18 | 17 |
| 1921..... | 17 | 16 | 15 | 15 | 15 | 14 | 14 | 15 | 15 | 15 | 15 | 15 |
| 1922..... | 15 | 15 | 15 | 15 | 13 | 13 | 14 | 15 | 15 | 15 | 15 | 16 |
| 1923..... | 16 | 15 | 15 | 15 | 14 | 14 | 14 | 14 | 15 | 15 | 16 | 15 |
| 1924..... | 15 | 14 | 14 | 14 | 13 | 13 | 13 | 13 | 14 | 14 | 15 | 15 |
| 1925..... | 15 | 15 | 15 | 15 | 15 | 14 | 14 | 15 | 15 | 15 | 15 | 15 |
| 1926..... | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| 1927..... | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 |
| 1928..... | 16 | 16 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 |
| 1929..... | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| Chicago: | | | | | | | | | | | | |
| 1920..... | 15 | 15 | 14 | 14 | 14 | 14 | 15 | 16 | 16 | 16 | 15 | 14 |
| 1921..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 12 | 12 | 12 | 12 |
| 1922..... | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 1923..... | 12½ | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1924..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1925..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1926..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1927..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1928..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1929..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| New Orleans: | | | | | | | | | | | | |
| 1920..... | 19 | 19 | 19 | 19 | 17 | 17 | 17 | 17 | 19 | 19 | 19 | 18 |
| 1921..... | 17 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 14 |
| 1922..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1923..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 14 |
| 1924..... | 14 | 15 | 15 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1925..... | 14 | 14 | 14 | 14 | 12 | 12 | 12 | 12 | 12 | 14 | 14 | 14 |
| 1926..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1927..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1928..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1929..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| San Francisco: | | | | | | | | | | | | |
| 1920..... | 16 | 16 | 15½ | 15 | 16 | 16 | 15½ | 17 | 17 | 17 | 17 | 17 |
| 1921..... | 15½ | 15½ | 15 | 15 | 15 | 14½ | 14½ | 14 | 14 | 13½ | 13½ | 13½ |
| 1922..... | 13½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 13 |
| 1923..... | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 12½ | 14 | 14 | 14 |
| 1924..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1925..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1926..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1927..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1928..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1929..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |

Bureau of Agricultural Economics. Compiled from reports of the bureau secured through the cooperation of milk distributors, producers' associations, and municipal officers.

TABLE 453.—*Milk, standard or grade B: Retail price per quart, delivered to family trade in cities, 1929*

| Market and year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| Boston..... | 15½ | 15½ | 15½ | 15½ | 15½ | 15½ | 15½ | 15½ | 15½ | 15½ | 15½ | 15½ |
| New York..... | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| Philadelphia..... | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 |
| Pittsburgh..... | 15 | 15 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| Cleveland..... | 14 | 14 | 12 | 12 | 12 | 12 | 12½ | 13 | 13 | 13 | 11 | 11 |
| Indianapolis..... | 13 | 13 | 13 | 12 | 12 | 12½ | 12 | 12 | 12 | 12 | 12 | 12 |
| Chicago..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| Detroit..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| Milwaukee..... | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 |
| Minneapolis..... | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| St. Louis..... | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| Kansas City, Mo..... | 13 | 13 | 14 | 14 | 14 | 14 | 13 | 14 | 13 | 14 | 13 | 13 |
| Washington, D. C..... | 14½ | 14½ | 14½ | 14½ | 14½ | 14½ | 14½ | 14½ | 14½ | 14½ | 14½ | 14½ |
| Jacksonville..... | 18½ | 18½ | 18½ | 18½ | 18½ | 19 | 18½ | 19 | 18½ | 18½ | 19 | 18½ |
| Louisville..... | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| Birmingham..... | 18 | 18 | 17 | 17 | 17 | 17 | 15 | 15 | 15 | 15 | 16 | 16 |
| New Orleans..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| Dallas..... | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| Butte..... | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| Denver..... | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Salt Lake City..... | 12 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Seattle..... | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12½ | 13 | 13 |
| Portland, Oreg..... | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Los Angeles..... | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| San Francisco..... | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |

Bureau of Agricultural Economics. Compiled from reports of the bureau secured through the cooperation of milk distributors, producers' associations, and municipal officers.

TABLE 454.—*Creamery butter production in factories in the United States, by States, 1919-1928*

| State | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|--------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Me..... | 1,141 | 727 | 305 | 309 | 424 | 271 | 137 | 547 | 517 | 348 |
| N. H..... | 397 | 300 | 305 | 309 | 424 | 271 | 137 | 90 | 72 | 44 |
| Vt..... | 10,677 | 13,253 | 14,919 | 12,280 | 11,935 | 12,294 | 9,372 | 8,305 | 6,732 | 5,460 |
| Mass..... | 2,849 | 3,198 | 3,895 | 2,999 | 1,811 | 1,700 | 2,000 | 1,150 | 2,514 | 2,340 |
| R. I..... | 65 | 58 | 77 | 76 | 76 | 106 | 68 | 75 | 100 | 66 |
| Conn..... | 930 | 877 | 1,165 | 986 | 753 | 820 | 675 | 617 | 550 | 401 |
| N. Eng- land..... | 16,059 | 18,413 | 21,080 | 17,255 | 15,434 | 15,848 | 12,757 | 11,784 | 10,485 | 8,668 |
| N. Y..... | 13,716 | 16,949 | 24,298 | 25,474 | 18,893 | 25,974 | 16,960 | 14,222 | 12,864 | 11,557 |
| N. J..... | 179 | 143 | 214 | 261 | 437 | 642 | 470 | 40 | 101 | 15 |
| Pa..... | 12,446 | 11,422 | 14,629 | 12,803 | 13,142 | 12,444 | 11,476 | 11,808 | 11,709 | 11,349 |
| Middle Atlantic..... | 26,341 | 28,514 | 39,141 | 38,538 | 32,472 | 39,060 | 28,606 | 26,079 | 24,674 | 22,921 |
| Ohio..... | 60,573 | 65,594 | 78,724 | 84,193 | 79,195 | 80,932 | 77,566 | 79,386 | 79,603 | 75,681 |
| Ind..... | 44,659 | 39,223 | 47,854 | 48,158 | 51,484 | 54,355 | 54,362 | 57,592 | 62,436 | 60,400 |
| Ill..... | 44,621 | 41,051 | 48,866 | 47,249 | 51,359 | 58,225 | 56,872 | 62,544 | 59,875 | 62,884 |
| Mich..... | 45,207 | 45,404 | 55,011 | 59,954 | 64,818 | 70,676 | 70,729 | 72,040 | 69,368 | 65,803 |
| Wis..... | 85,054 | 97,355 | 124,504 | 142,235 | 139,896 | 153,335 | 161,369 | 159,733 | 153,545 | 137,483 |
| E. North Central..... | 280,114 | 288,627 | 354,959 | 381,789 | 386,751 | 417,523 | 420,898 | 431,295 | 424,827 | 402,240 |
| Minn..... | 130,786 | 120,297 | 154,268 | 170,463 | 199,926 | 229,474 | 245,069 | 268,437 | 274,860 | 271,345 |
| Iowa..... | 87,915 | 84,290 | 106,516 | 129,778 | 141,407 | 159,378 | 156,361 | 168,827 | 177,224 | 196,068 |
| Mo..... | 38,411 | 35,228 | 42,422 | 40,565 | 51,818 | 56,801 | 55,953 | 60,861 | 62,549 | 69,201 |
| N. Dak..... | 14,697 | 13,419 | 10,177 | 21,075 | 23,355 | 28,515 | 31,500 | 34,898 | 32,462 | 30,889 |
| S. Dak..... | 17,479 | 14,071 | 18,886 | 21,146 | 27,447 | 24,643 | 29,193 | 29,814 | 32,843 | 34,853 |
| Nebr..... | 60,467 | 56,661 | 66,653 | 74,809 | 76,748 | 81,423 | 83,930 | 90,882 | 95,004 | 96,472 |
| Kans..... | 35,642 | 32,899 | 37,000 | 40,204 | 42,674 | 46,844 | 47,768 | 50,998 | 50,667 | 55,756 |
| W. North Central..... | 385,397 | 356,865 | 441,922 | 504,640 | 563,375 | 627,078 | 650,374 | 710,717 | 725,609 | 754,584 |
| Del..... | 253 | 350 | 395 | 203 | 154 | 150 | 80 | 67 | 50 | 47 |
| Md..... | 315 | 440 | 620 | 542 | 382 | 500 | 339 | 266 | 229 | 223 |
| D. C..... | 5 | 503 | 577 | 475 | 10 | ----- | 461 | 52 | ----- | ----- |
| Va..... | 1,507 | 2,210 | 2,833 | 3,118 | 4,231 | 4,614 | 3,842 | 4,378 | 5,881 | 6,051 |
| W. Va..... | 328 | 867 | 530 | 420 | 276 | 466 | 533 | 487 | 287 | 325 |
| N. C..... | 829 | 832 | 1,263 | 1,549 | 1,718 | 1,683 | 1,556 | 1,680 | 2,032 | 1,849 |
| S. C..... | 27 | 16 | 19 | 165 | 537 | 527 | 429 | 364 | 432 | 392 |
| Ga..... | 6 | 7 | 85 | 979 | 1,868 | 1,826 | 1,836 | 1,952 | 3,044 | 2,224 |
| Fla..... | 17 | ----- | 11 | 81 | 99 | 20 | 22 | 105 | 129 | 153 |
| S. Atlantic..... | 3,377 | 5,225 | 6,333 | 7,532 | 9,275 | 9,786 | 9,098 | 9,381 | 12,084 | 11,264 |
| Ky..... | 5,321 | 7,875 | 10,746 | 12,010 | 12,244 | 12,942 | 14,087 | 10,975 | 19,364 | 19,822 |
| Tenn..... | 3,735 | 5,903 | 8,707 | 9,164 | 11,463 | 12,762 | 11,286 | 11,826 | 17,190 | 15,333 |
| Ala..... | 696 | 908 | 742 | 917 | 831 | 839 | 1,086 | 901 | 1,237 | 901 |
| Miss..... | 2,477 | 2,626 | 4,286 | 5,778 | 5,715 | 5,648 | 4,895 | 6,896 | 7,920 | 7,241 |
| E. South Central..... | 12,229 | 16,802 | 24,481 | 27,869 | 30,253 | 32,191 | 31,354 | 36,688 | 45,711 | 43,387 |
| Ark..... | 303 | 345 | 586 | 731 | 996 | 1,259 | 1,174 | 1,325 | 1,710 | 1,115 |
| La..... | 46 | 55 | 160 | 87 | 185 | 125 | 90 | 92 | 324 | 461 |
| Okla..... | 10,481 | 9,596 | 10,427 | 11,142 | 14,065 | 14,421 | 15,841 | 19,664 | 23,617 | 24,277 |
| Tex..... | 8,289 | 9,125 | 11,267 | 10,179 | 10,956 | 11,997 | 10,866 | 14,594 | 24,276 | 20,599 |
| W. South Central..... | 19,179 | 19,121 | 22,430 | 22,139 | 26,202 | 27,902 | 27,971 | 35,675 | 49,927 | 46,452 |
| Wyo..... | 1,140 | 875 | 1,277 | 1,403 | 1,894 | 1,941 | 1,999 | 2,289 | 2,009 | 1,831 |
| Colo..... | 13,144 | 12,979 | 15,290 | 16,410 | 18,625 | 18,130 | 18,794 | 18,255 | 20,871 | 21,614 |
| N. Mex..... | 6 | 6 | 29 | 129 | 185 | 251 | 326 | 455 | 447 | 421 |
| Idaho..... | 4,514 | 4,660 | 4,935 | 7,582 | 9,883 | 13,431 | 15,101 | 18,456 | 20,918 | 20,833 |
| Ariz..... | 1,000 | 828 | 1,358 | 623 | 600 | 2,107 | 1,034 | 1,489 | 2,150 | 2,246 |
| Utah..... | 3,796 | 3,567 | 4,549 | 5,913 | 7,500 | 8,585 | 7,034 | 8,037 | 9,909 | 9,549 |
| Nev..... | 1,726 | 2,018 | 2,388 | 2,642 | 2,361 | 2,640 | 2,593 | 2,432 | 2,187 | 2,211 |
| Mont..... | 5,389 | 5,168 | 7,439 | 7,713 | 10,667 | 13,874 | 13,968 | 15,549 | 16,759 | 16,364 |
| Moun- tain..... | 30,715 | 30,101 | 37,265 | 42,415 | 51,715 | 60,959 | 60,849 | 66,902 | 75,250 | 75,068 |
| Wash..... | 18,487 | 23,751 | 23,228 | 24,239 | 26,666 | 29,331 | 25,678 | 28,914 | 29,870 | 29,453 |
| Oreg..... | 14,432 | 14,288 | 15,289 | 17,158 | 18,128 | 20,993 | 21,575 | 22,570 | 22,831 | 20,963 |
| Calif..... | 61,795 | 61,870 | 68,810 | 69,941 | 81,943 | 75,509 | 72,871 | 71,701 | 75,227 | 72,050 |
| Pacific..... | 94,714 | 99,909 | 107,827 | 111,338 | 126,737 | 125,833 | 119,619 | 123,186 | 127,928 | 122,465 |
| Total..... | 868,125 | 963,577 | 1,064,938 | 1,153,515 | 1,242,214 | 1,356,080 | 1,361,526 | 1,451,766 | 1,496,495 | 1,487,049 |

Bureau of Agricultural Economics. The compilations are made from reports of factories to the bureau.

TABLE 455.—*Creamery butter: Receipts, gross weight, at five markets, specified years*

| Market and year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| New York— | | | | | | | | | | | | | |
| 1927 | 17,845 | 17,878 | 20,455 | 20,528 | 26,579 | 32,262 | 28,782 | 26,000 | 20,344 | 19,013 | 16,041 | 15,489 | 261,322 |
| 1928 | 18,945 | 18,474 | 20,556 | 19,264 | 22,539 | 27,412 | 26,559 | 23,722 | 21,103 | 19,107 | 17,067 | 15,300 | 250,593 |
| 1929 | 19,498 | 18,873 | 20,486 | 21,895 | 26,751 | 27,936 | 29,700 | 23,854 | 20,657 | 20,983 | 17,032 | 18,095 | 265,780 |
| Chicago— | | | | | | | | | | | | | |
| 1927 | 14,885 | 14,810 | 18,412 | 21,084 | 26,918 | 32,140 | 27,780 | 22,380 | 16,037 | 14,513 | 13,004 | 13,237 | 235,200 |
| 1928 | 17,052 | 15,928 | 19,232 | 17,881 | 22,649 | 29,784 | 25,654 | 21,367 | 16,418 | 15,295 | 14,036 | 15,228 | 230,514 |
| 1929 | 18,158 | 16,356 | 18,758 | 19,056 | 25,935 | 30,081 | 27,119 | 22,793 | 17,130 | 16,832 | 15,766 | 16,048 | 244,632 |
| Philadelphia— | | | | | | | | | | | | | |
| 1927 | 6,053 | 5,763 | 6,517 | 6,487 | 8,970 | 9,936 | 8,287 | 7,596 | 5,828 | 5,325 | 5,447 | 5,549 | 81,727 |
| 1928 | 6,716 | 6,343 | 6,725 | 6,429 | 7,578 | 10,077 | 8,640 | 7,735 | 6,090 | 6,404 | 5,532 | 6,626 | 84,495 |
| 1929 | 6,781 | 6,158 | 6,706 | 6,745 | 8,839 | 9,491 | 8,918 | 7,570 | 6,073 | 6,309 | 6,342 | 6,554 | 87,396 |
| Boston— | | | | | | | | | | | | | |
| 1927 | 4,590 | 5,366 | 6,129 | 6,558 | 10,143 | 12,245 | 11,932 | 8,847 | 5,949 | 4,636 | 3,865 | 4,357 | 84,617 |
| 1928 | 5,874 | 5,619 | 5,985 | 6,768 | 8,658 | 11,454 | 12,562 | 9,380 | 6,331 | 5,501 | 4,292 | 4,891 | 87,324 |
| 1929 | 6,091 | 5,259 | 6,915 | 6,656 | 9,216 | 10,787 | 11,063 | 7,812 | 5,922 | 4,652 | 4,030 | 3,780 | 81,183 |
| San Francisco— | | | | | | | | | | | | | |
| 1927 | 1,883 | 1,685 | 2,120 | 2,641 | 2,925 | 3,190 | 2,919 | 2,627 | 1,897 | 1,938 | 1,538 | 1,346 | 26,709 |
| 1928 | 1,508 | 1,433 | 1,852 | 1,816 | 2,158 | 2,591 | 2,486 | 2,328 | 1,939 | 2,005 | 1,869 | 2,047 | 24,032 |
| 1929 | 1,962 | 1,911 | 1,814 | 2,529 | 3,138 | 2,885 | 2,642 | 2,074 | 1,590 | 1,470 | 1,569 | 1,571 | 25,155 |
| Total— | | | | | | | | | | | | | |
| 1918 | | | 49,308 | 45,048 | 50,851 | 83,058 | 79,149 | 60,956 | 46,708 | 51,160 | 38,277 | 35,797 | 539,821 |
| 1919 | 37,867 | 34,846 | 36,592 | 41,287 | 63,669 | 84,993 | 68,926 | 55,246 | 43,282 | 35,573 | 30,731 | 25,910 | 558,922 |
| 1920 | 29,827 | 29,009 | 35,314 | 28,002 | 43,571 | 66,043 | 71,167 | 53,714 | 43,551 | 33,378 | 26,917 | 26,050 | 488,543 |
| 1921 | 30,779 | 28,935 | 35,154 | 39,088 | 59,563 | 78,449 | 61,464 | 62,734 | 50,216 | 45,350 | 36,371 | 27,257 | 565,410 |
| 1922 | 41,775 | 30,041 | 45,104 | 40,716 | 67,063 | 92,632 | 76,018 | 60,172 | 45,577 | 40,595 | 37,372 | 38,401 | 625,363 |
| 1923 | 47,843 | 39,877 | 48,955 | 47,947 | 64,328 | 89,976 | 75,336 | 56,249 | 49,307 | 45,393 | 39,759 | 41,460 | 646,424 |
| 1924 | 44,476 | 47,756 | 52,328 | 51,690 | 67,572 | 91,742 | 92,036 | 67,959 | 56,247 | 49,760 | 37,605 | 38,639 | 671,990 |
| 1925 | 44,825 | 41,785 | 48,351 | 50,035 | 67,454 | 88,024 | 82,918 | 68,341 | 53,303 | 51,599 | 42,099 | 42,993 | 681,727 |
| 1926 | 46,809 | 46,809 | 54,046 | 53,990 | 64,653 | 89,993 | 81,053 | 59,842 | 52,985 | 45,280 | 40,588 | 42,825 | 679,480 |
| 1927 | 44,756 | 45,502 | 53,633 | 57,208 | 75,536 | 89,773 | 79,670 | 68,055 | 50,055 | 45,250 | 39,895 | 39,978 | 689,575 |
| 1928 | 50,095 | 47,797 | 54,300 | 52,158 | 63,582 | 81,318 | 75,901 | 64,531 | 52,481 | 48,907 | 42,796 | 43,092 | 676,958 |
| 1929 | 52,490 | 48,557 | 53,979 | 56,881 | 73,870 | 81,180 | 79,442 | 64,103 | 51,972 | 50,246 | 44,739 | 46,648 | 704,116 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

¹ 10-months' total, March to December, inclusive.

TABLE 456.—*Creamery butter: Production reported by factories, United States, 1917-1928*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| 1917 | 43,997 | 38,459 | 47,371 | 53,800 | 75,108 | 98,898 | 94,151 | 83,936 | 76,744 | 56,176 | 42,705 | 48,157 | 759,511 |
| 1918 | 46,432 | 44,464 | 51,161 | 59,407 | 87,639 | 106,406 | 99,515 | 87,223 | 74,462 | 65,961 | 47,816 | 47,635 | 818,175 |
| 1919 | 53,604 | 45,745 | 56,227 | 68,902 | 105,346 | 120,762 | 106,156 | 86,245 | 70,508 | 60,128 | 46,448 | 43,063 | 868,125 |
| 1920 | 49,044 | 46,355 | 56,303 | 60,622 | 86,845 | 114,695 | 110,844 | 90,669 | 77,106 | 65,129 | 55,572 | 39,965 | 863,577 |
| 1921 | 58,906 | 56,556 | 67,677 | 82,763 | 119,077 | 130,633 | 111,808 | 111,638 | 89,832 | 84,374 | 70,024 | 71,460 | 1,054,938 |
| 1922 | 73,505 | 67,405 | 79,532 | 86,223 | 132,351 | 150,034 | 135,231 | 114,160 | 92,536 | 83,070 | 68,628 | 70,617 | 1,153,515 |
| 1923 | 83,688 | 74,134 | 88,311 | 100,547 | 134,350 | 158,371 | 138,278 | 120,802 | 102,273 | 89,297 | 74,900 | 77,254 | 1,242,214 |
| 1924 | 87,468 | 86,731 | 95,760 | 100,127 | 139,954 | 161,992 | 164,443 | 137,836 | 115,102 | 100,536 | 77,282 | 82,964 | 1,356,080 |
| 1925 | 87,121 | 80,218 | 92,302 | 107,023 | 145,478 | 164,253 | 158,920 | 136,738 | 108,325 | 104,520 | 85,492 | 91,136 | 1,361,526 |
| 1926 | 97,893 | 94,222 | 112,432 | 121,049 | 155,912 | 178,276 | 159,554 | 133,294 | 116,732 | 103,688 | 88,481 | 90,853 | 1,451,766 |
| 1927 | 97,965 | 95,522 | 111,451 | 126,415 | 168,808 | 188,792 | 170,484 | 146,808 | 113,546 | 102,399 | 86,058 | 88,247 | 1,496,495 |
| 1928 | 110,045 | 99,394 | 111,777 | 118,849 | 156,294 | 181,037 | 167,601 | 145,430 | 119,499 | 105,894 | 87,874 | 92,494 | 1,487,409 |

Bureau of Agricultural Economics.

TABLE 457.—*Creamery butter: ¹ Cold-storage holdings, United States, 1915-1929*

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1915 | | | | | | | | 68,578 | 101,662 | 98,450 | 92,719 | 71,849 |
| 1916 | 48,977 | 31,139 | 15,033 | 3,346 | 1,082 | 7,017 | 83,863 | 102,537 | 105,836 | 100,522 | 85,260 | 67,292 |
| 1917 | 46,134 | 30,474 | 16,952 | 6,805 | 3,607 | 9,953 | 49,982 | 88,992 | 108,179 | 109,154 | 100,115 | 79,926 |
| 1918 | 50,726 | 26,618 | 18,906 | 14,629 | 9,636 | 12,698 | 49,140 | 86,905 | 99,334 | 87,883 | 80,874 | 65,111 |
| 1919 | 43,910 | 36,777 | 24,191 | 11,909 | 9,659 | 29,435 | 90,168 | 123,546 | 131,388 | 121,816 | 100,474 | 73,654 |
| 1920 | 53,737 | 38,359 | 22,568 | 12,555 | 7,554 | 12,872 | 62,536 | 101,455 | 115,558 | 113,385 | 101,778 | 78,750 |
| 1921 | 58,682 | 41,486 | 27,103 | 14,732 | 7,712 | 21,682 | 61,991 | 82,838 | 92,292 | 90,118 | 77,983 | 65,129 |
| 1922 | 48,412 | 35,047 | 22,582 | 9,113 | 3,590 | 13,202 | 67,410 | 101,774 | 102,731 | 96,117 | 76,472 | 57,603 |
| 1923 | 26,819 | 16,122 | 8,910 | 4,824 | 3,248 | 10,112 | 52,768 | 124,118 | 156,440 | 153,494 | 135,018 | 100,832 |
| 1924 | 30,269 | 15,246 | 9,847 | 7,842 | 5,913 | 22,348 | 63,687 | 109,075 | 128,403 | 114,172 | 94,916 | 74,754 |
| 1925 | 65,694 | 45,748 | 28,799 | 10,875 | 3,739 | 13,036 | 86,897 | 131,152 | 138,151 | 125,342 | 100,871 | 64,381 |
| 1926 | 52,785 | 39,381 | 26,313 | 17,392 | 17,527 | 22,561 | 80,996 | 145,147 | 163,701 | 147,396 | 118,679 | 83,224 |
| 1927 | 84,947 | 17,952 | 7,952 | 3,044 | 3,436 | 28,404 | 69,750 | 120,437 | 136,175 | 128,071 | 105,811 | 70,985 |
| 1928 | 46,289 | 28,273 | 14,404 | 5,716 | 5,109 | 15,952 | 69,750 | 120,437 | 136,175 | 128,071 | 105,811 | 70,985 |
| 1929 | 43,783 | 24,747 | 11,910 | 5,332 | 5,883 | 28,369 | 91,962 | 151,621 | 168,952 | 158,541 | 138,405 | 111,560 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

¹ Quantities given are net weights.

TABLE 458.—Butter: Gross receipts by State of origin, 1923-1929

NEW YORK

| State of origin | 1929 | | | | | | | | | | | |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Total | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. |
| Minnesota..... | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Iowa..... | 84,944 | 87,081 | 87,081 | 87,081 | 87,081 | 87,081 | 87,081 | 87,081 | 87,081 | 87,081 | 87,081 | 87,081 |
| Illinois..... | 49,440 | 57,781 | 57,781 | 57,781 | 57,781 | 57,781 | 57,781 | 57,781 | 57,781 | 57,781 | 57,781 | 57,781 |
| Nebraska..... | 33,830 | 35,089 | 35,089 | 35,089 | 35,089 | 35,089 | 35,089 | 35,089 | 35,089 | 35,089 | 35,089 | 35,089 |
| Ohio..... | 20,339 | 24,811 | 24,811 | 24,811 | 24,811 | 24,811 | 24,811 | 24,811 | 24,811 | 24,811 | 24,811 | 24,811 |
| Wisconsin..... | 9,834 | 7,350 | 7,350 | 7,350 | 7,350 | 7,350 | 7,350 | 7,350 | 7,350 | 7,350 | 7,350 | 7,350 |
| New York..... | 11,771 | 13,730 | 13,730 | 13,730 | 13,730 | 13,730 | 13,730 | 13,730 | 13,730 | 13,730 | 13,730 | 13,730 |
| Michigan..... | 6,130 | 8,185 | 8,185 | 8,185 | 8,185 | 8,185 | 8,185 | 8,185 | 8,185 | 8,185 | 8,185 | 8,185 |
| Indiana..... | 7,075 | 11,265 | 11,265 | 11,265 | 11,265 | 11,265 | 11,265 | 11,265 | 11,265 | 11,265 | 11,265 | 11,265 |
| Missouri..... | 5,923 | 3,788 | 3,788 | 3,788 | 3,788 | 3,788 | 3,788 | 3,788 | 3,788 | 3,788 | 3,788 | 3,788 |
| Pennsylvania..... | 4,640 | 3,988 | 3,988 | 3,988 | 3,988 | 3,988 | 3,988 | 3,988 | 3,988 | 3,988 | 3,988 | 3,988 |
| Tennessee..... | 1,273 | 839 | 839 | 839 | 839 | 839 | 839 | 839 | 839 | 839 | 839 | 839 |
| California..... | 1,132 | 839 | 839 | 839 | 839 | 839 | 839 | 839 | 839 | 839 | 839 | 839 |
| Kansas..... | 258 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| Massachusetts..... | 1,264 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 |
| Virginia..... | 259 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 |
| South Dakota..... | 417 | 684 | 684 | 684 | 684 | 684 | 684 | 684 | 684 | 684 | 684 | 684 |
| Kentucky..... | 260 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 |
| North Dakota..... | 517 | 934 | 934 | 934 | 934 | 934 | 934 | 934 | 934 | 934 | 934 | 934 |
| Vermont..... | 134 | 397 | 397 | 397 | 397 | 397 | 397 | 397 | 397 | 397 | 397 | 397 |
| Montana..... | 46 | 131 | 131 | 131 | 131 | 131 | 131 | 131 | 131 | 131 | 131 | 131 |
| Maryland..... | 151 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 |
| North Carolina..... | 338 | 193 | 193 | 193 | 193 | 193 | 193 | 193 | 193 | 193 | 193 | 193 |
| Georgia..... | 98 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Alabama..... | 234 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| Washington..... | 194 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| New Jersey..... | 129 | 466 | 466 | 466 | 466 | 466 | 466 | 466 | 466 | 466 | 466 | 466 |
| Mississippi..... | 142 | 203 | 203 | 203 | 203 | 203 | 203 | 203 | 203 | 203 | 203 | 203 |
| Missouri..... | 261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 |
| Oklahoma..... | 37 | 363 | 363 | 363 | 363 | 363 | 363 | 363 | 363 | 363 | 363 | 363 |
| Montana..... | 281 | 327 | 327 | 327 | 327 | 327 | 327 | 327 | 327 | 327 | 327 | 327 |
| Other States..... | 686 | 852 | 852 | 852 | 852 | 852 | 852 | 852 | 852 | 852 | 852 | 852 |
| Canada..... | 3,031 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 |
| Total..... | 243,764 | 248,759 | 244,127 | 252,742 | 261,322 | 250,563 | 265,760 | 243,764 | 248,759 | 244,127 | 252,742 | 261,322 |

CHICAGO

| | | | | | | | | | | | | | | | | | | | |
|-------------------|---------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Wisconsin..... | 70,588 | 73,928 | 75,941 | 72,200 | 64,611 | 58,108 | 65,356 | 3,895 | 3,972 | 4,539 | 5,092 | 7,206 | 8,705 | 8,138 | 6,563 | 4,811 | 4,559 | 3,903 | 4,073 |
| Minnesota..... | 39,611 | 46,767 | 54,859 | 43,569 | 48,057 | 50,230 | 54,043 | 5,962 | 4,321 | 4,907 | 5,039 | 4,819 | 5,748 | 5,049 | 4,276 | 3,492 | 3,365 | 3,239 | 3,106 |
| Iowa..... | 42,108 | 46,896 | 46,150 | 41,092 | 39,347 | 39,948 | 44,152 | 2,677 | 2,735 | 3,220 | 3,004 | 5,230 | 6,057 | 5,223 | 4,585 | 3,523 | 2,975 | 2,517 | 2,514 |
| Nebraska..... | 17,433 | 20,954 | 19,381 | 22,505 | 17,060 | 19,498 | 17,450 | 1,455 | 1,405 | 1,561 | 1,562 | 1,942 | 2,201 | 1,756 | 1,309 | 766 | 975 | 1,373 | 1,142 |
| South Dakota..... | 14,249 | 15,971 | 18,151 | 16,402 | 16,513 | 18,270 | 16,187 | 1,494 | 1,415 | 1,669 | 1,327 | 1,470 | 1,856 | 1,672 | 1,252 | 1,144 | 1,030 | 800 | 836 |
| Kansas..... | 10,300 | 11,098 | 7,864 | 8,036 | 9,989 | 12,961 | 11,185 | 734 | 695 | 740 | 867 | 1,154 | 1,242 | 1,224 | 1,177 | 758 | 727 | 1,036 | 831 |
| Illinois..... | 7,392 | 8,870 | 5,819 | 6,632 | 8,057 | 6,371 | 8,406 | 138 | 75 | 164 | 193 | 984 | 1,155 | 1,552 | 1,098 | 755 | 615 | 797 | 960 |
| Missouri..... | 11,188 | 11,975 | 9,678 | 10,411 | 13,484 | 11,508 | 13,020 | 1,065 | 833 | 542 | 691 | 1,610 | 1,408 | 1,552 | 1,092 | 902 | 1,083 | 1,100 | 1,538 |
| North Dakota..... | 3,418 | 6,301 | 8,511 | 6,114 | 4,181 | 2,919 | 3,287 | 184 | 254 | 679 | 325 | 189 | 414 | 359 | 199 | 166 | 308 | 159 | 51 |
| Oklahoma..... | 1,894 | 2,144 | 2,735 | 4,392 | 4,510 | 2,329 | 3,175 | 210 | 190 | 157 | 166 | 427 | 210 | 246 | 362 | 345 | 348 | 268 | 246 |
| Colorado..... | 1,239 | 1,879 | 4,300 | 828 | 678 | 1,315 | 977 | 33 | 97 | 117 | 82 | 116 | 130 | 183 | 127 | 44 | 30 | 7 | 11 |
| Ohio..... | 425 | 360 | 619 | 417 | 1,024 | 128 | 78 | 6 | 13 | 6 | 1 | 1 | 5 | 4 | 3 | 5 | 11 | 7 | 16 |
| Michigan..... | 1,966 | 1,761 | 1,474 | 1,297 | 1,024 | 923 | 534 | 27 | 65 | 190 | 91 | 118 | 136 | 82 | 39 | 16 | 33 | 10 | 47 |
| Indiana..... | 1,109 | 1,102 | 805 | 867 | 749 | 943 | 1,098 | 108 | 100 | 54 | 65 | 138 | 107 | 77 | 87 | 53 | 84 | 109 | 86 |
| Kentucky..... | 1,871 | 560 | 539 | 957 | 1,898 | 1,894 | 2,067 | 110 | 100 | 72 | 50 | 130 | 129 | 124 | 126 | 110 | 329 | 388 | 399 |
| Texas..... | 216 | 102 | 78 | 212 | 3,690 | 2,322 | 2,325 | 96 | 35 | 32 | 160 | 316 | 440 | 132 | 355 | 205 | 219 | 122 | 183 |
| Montana..... | 643 | 1,077 | 343 | 107 | 194 | 165 | 235 | 27 | 27 | 76 | 90 | 30 | 5 | 5 | 4 | 1 | 2 | 2 | 14 |
| Tennessee..... | 112 | 35 | 137 | 126 | 438 | 113 | 166 | 17 | 3 | 5 | 10 | 4 | 5 | 44 | 32 | 2 | 4 | 26 | 14 |
| Mississippi..... | 319 | 77 | 66 | 44 | 31 | 49 | 239 | 18 | (1) | 2 | 4 | 1 | 71 | 53 | 69 | --- | 21 | --- | --- |
| California..... | --- | --- | --- | --- | 76 | 26 | 56 | 1 | --- | (1) | --- | --- | --- | --- | (1) | --- | (1) | --- | --- |
| Pennsylvania..... | --- | --- | 55 | 43 | 2 | 15 | 8 | 8 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 55 |
| Idaho..... | 223 | 103 | 64 | 64 | 31 | 7 | 8 | --- | --- | 10 | --- | --- | --- | 2 | --- | 1 | --- | 1 | 14 |
| New York..... | 25 | 153 | 69 | 35 | 376 | 275 | 35 | 8 | 8 | 13 | 17 | 50 | 60 | 38 | 8 | 1 | 22 | 4 | 4 |
| Other States..... | 158 | 520 | 154 | 196 | 376 | 177 | 233 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total..... | 225,892 | 238,063 | 254,308 | 236,546 | 235,200 | 230,514 | 244,632 | 18,158 | 16,356 | 18,758 | 19,056 | 25,635 | 30,081 | 27,119 | 22,793 | 17,130 | 16,832 | 15,766 | 16,648 |

¹ Not over 500 pounds.

² Totals include receipts from Canada as follows: Chicago, 215 in 1923 and 470 in 1925 Philadelphia, 252 in 1923, 391 in 1924, 173 in 1925; Boston, 137 in 1923, 26 in 1924, 1 in 1926, 5 in 1927, 2 in 1928; San Francisco, 316 in 1923, 326 in 1925.

TABLE 458.—Butter: Gross receipts by State of origin, 1923-1929—Continued
PHILADELPHIA

| State of origin | 1929 | | | | | | | | | | | 1928 | 1927 | 1926 | 1925 | 1924 | 1923 |
|---------------------|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------|-------|-------|-------|
| | Total | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | | | | |
| Minnesota..... | 1,000 pounds 54,499 | 1,000 pounds 4,564 | 1,000 pounds 3,798 | 1,000 pounds 4,761 | 1,000 pounds 4,184 | 1,000 pounds 5,797 | 1,000 pounds 5,875 | 1,000 pounds 5,495 | 1,000 pounds 4,742 | 1,000 pounds 3,997 | 1,000 pounds 3,893 | 1,000 pounds 3,817 | 1,000 pounds 3,866 | | | | |
| Illinois..... | 45,478 | 4,807 | 3,811 | 4,023 | 296 | 163 | 243 | 369 | 427 | 3,957 | 3,893 | 3,817 | 3,866 | | | | |
| Ohio..... | 3,162 | 1,097 | 2,665 | 122 | 145 | 182 | 237 | 301 | 161 | 157 | 236 | 750 | 466 | | | | |
| Pennsylvania..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Indiana..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Wisconsin..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Michigan..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| New York..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Iowa..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Missouri..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Tennessee..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Virginia..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| California..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| New Jersey..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| North Dakota..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Delaware..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Nebraska..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Maryland..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| South Dakota..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Kentucky..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Kansas..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| North Carolina..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| West Virginia..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Mississippi..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Other States..... | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | 1,735 | | | | |
| Total..... | 88,598 | 76,731 | 72,064 | 79,345 | 81,727 | 84,495 | 87,396 | 6,781 | 6,158 | 7,008 | 6,745 | 8,839 | 9,491 | 8,918 | 7,570 | 6,309 | 6,554 |

BOSTON

| | | | | | | | | | | | | | | | | | | | |
|--------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|--------|--------|-------|-------|-------|-------|-------|
| Illinois..... | 33,517 | 25,384 | 13,555 | 11,766 | 13,557 | 12,251 | 11,893 | 1,098 | 939 | 763 | 1,065 | 1,475 | 1,726 | 1,721 | 899 | 522 | 520 | 570 | 595 |
| Minnesota..... | 15,880 | 22,744 | 26,975 | 30,948 | 30,830 | 33,652 | 28,908 | 1,967 | 1,687 | 2,379 | 2,658 | 2,925 | 3,463 | 3,968 | 2,974 | 2,222 | 1,659 | 1,556 | 1,395 |
| Vermont..... | 5,854 | 5,923 | 4,071 | 3,075 | 2,318 | 1,974 | 1,781 | 97 | 94 | 95 | 135 | 115 | 86 | 50 | 45 | 22 | 18 | 19 | 5 |
| New York..... | 5,578 | 5,468 | 5,769 | 3,327 | 2,607 | 1,626 | 1,380 | 164 | 62 | 126 | 152 | 69 | 93 | 73 | 262 | 159 | 147 | 71 | 56 |
| Iowa..... | 3,023 | 3,361 | 4,360 | 4,616 | 3,969 | 4,261 | 4,257 | 168 | 148 | 126 | 285 | 511 | 594 | 653 | 407 | 482 | 462 | 199 | 222 |
| Ohio..... | 3,064 | 3,263 | 2,661 | 2,046 | 2,751 | 2,808 | 3,214 | 211 | 157 | 128 | 139 | 380 | 615 | 427 | 257 | 182 | 227 | 210 | 251 |
| Indiana..... | 2,722 | 2,436 | 1,434 | 1,122 | 1,576 | 1,808 | 3,495 | 344 | 137 | 90 | 99 | 242 | 680 | 532 | 330 | 317 | 234 | 257 | 243 |
| Nebraska..... | 3,274 | 6,378 | 8,086 | 8,860 | 10,335 | 12,159 | 12,315 | 1,012 | 846 | 1,083 | 1,068 | 1,540 | 1,501 | 1,363 | 1,187 | 885 | 637 | 613 | 560 |
| Michigan..... | 1,555 | 2,394 | 1,867 | 1,928 | 1,675 | 1,787 | 703 | 8 | 4 | 36 | 5 | 65 | 146 | 154 | 69 | 16 | 68 | 33 | 99 |
| South Dakota..... | 1,891 | 2,450 | 3,070 | 3,609 | 3,526 | 2,985 | 2,851 | 102 | 93 | 160 | 75 | 294 | 443 | 657 | 530 | 371 | 101 | 22 | 8 |
| Missouri..... | 1,641 | 1,404 | 3,170 | 2,940 | 3,151 | 2,989 | 3,221 | 349 | 284 | 216 | 137 | 311 | 434 | 476 | 213 | 269 | 157 | 193 | 182 |
| Wisconsin..... | 1,813 | 1,963 | 2,463 | 3,101 | 2,238 | 2,057 | 1,679 | 66 | 37 | 91 | 48 | 310 | 388 | 306 | 105 | 142 | 80 | 70 | 36 |
| Massachusetts..... | 702 | 723 | 989 | 735 | 2,346 | 168 | 15 | 2 | (1) | (1) | 1 | (1) | 1 | (1) | (1) | 1 | (1) | (1) | (1) |
| New Hampshire..... | 263 | 143 | 19 | 22 | 94 | 14 | 3 | 1 | 93 | 1 | 1 | (1) | 42 | 15 | (1) | 20 | 21 | (1) | (1) |
| Pennsylvania..... | 188 | 26 | 143 | 119 | 240 | 95 | 192 | 21 | (1) | 1 | 135 | 64 | 64 | 44 | 156 | 45 | 42 | 43 | 30 |
| Kentucky..... | 72 | 91 | 46 | 30 | 228 | 298 | 1,268 | 113 | 115 | 91 | 224 | 168 | 165 | 104 | 104 | 60 | 63 | (1) | 61 |
| Kansas..... | 402 | 507 | 1,048 | 1,705 | 1,532 | 1,801 | 1,268 | (1) | (1) | 1 | 1 | 2 | 6 | 1 | 1 | 1 | 3 | (1) | 1 |
| Maine..... | 87 | 196 | 187 | 116 | 167 | 86 | 17 | 45 | 46 | 22 | 90 | 143 | 122 | 163 | 36 | 53 | 31 | 50 | 24 |
| Oklahoma..... | 196 | 288 | 151 | 463 | 664 | 575 | 825 | 241 | 399 | 390 | 314 | 183 | 128 | 120 | 174 | 87 | 132 | 62 | 17 |
| North Dakota..... | 1,545 | 1,230 | 2,167 | 2,479 | 1,871 | 1,227 | 2,247 | 241 | 399 | 29 | 28 | 138 | 90 | 205 | 63 | 86 | (1) | (1) | (1) |
| Montana..... | 49 | 20 | 39 | 24 | 183 | 14 | 29 | 87 | 110 | 152 | 138 | 338 | 90 | 205 | 63 | 86 | (1) | (1) | (1) |
| Other States..... | 231 | 261 | 201 | 211 | 754 | 1,616 | 1,310 | 87 | 110 | 152 | 138 | 338 | 90 | 205 | 63 | 86 | (1) | (1) | (1) |
| Total..... | 82,659 | 86,921 | 82,476 | 83,243 | 84,617 | 87,324 | 81,183 | 6,091 | 5,259 | 5,915 | 6,656 | 9,216 | 10,787 | 11,063 | 7,812 | 5,922 | 4,652 | 4,030 | 3,780 |

SAN FRANCISCO

| | | | | | | | | | | | | | | | | | | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|--------|--------|-------|-------|-------|-------|-------|
| California..... | 21,805 | 22,984 | 21,587 | 20,701 | 18,976 | 17,732 | 19,070 | 1,466 | 1,328 | 1,572 | 2,301 | 2,663 | 2,241 | 1,892 | 1,400 | 1,105 | 1,020 | 1,115 | 967 |
| Oregon..... | 1,177 | 948 | 1,195 | 2,306 | 2,253 | 1,796 | 2,748 | 224 | 226 | 170 | 175 | 360 | 397 | 389 | 259 | 138 | 9 | 130 | 128 |
| Washington..... | 1,682 | 606 | 469 | 327 | 300 | 182 | 231 | 1 | 136 | 1 | 1 | 1 | 2 | 55 | 6 | 7 | 3 | 4 | 23 |
| Nevada..... | 293 | 258 | 252 | 63 | 113 | 74 | 41 | 1 | (1) | 1 | 46 | 91 | 73 | 11 | 11 | 9 | 4 | 9 | 9 |
| Idaho..... | 502 | 490 | 1,043 | 1,191 | 1,722 | 2,255 | 1,361 | 95 | 104 | 60 | 46 | 16 | 102 | 146 | 91 | 130 | 128 | 153 | 270 |
| Montana..... | 361 | 700 | 1,895 | 2,331 | 2,173 | 2,150 | 1,222 | 151 | 90 | 100 | 7 | 7 | 21 | 102 | 240 | 138 | 118 | 137 | 84 |
| Utah..... | 179 | 158 | 198 | 95 | 223 | 384 | 134 | 24 | 18 | 11 | 7 | 7 | 21 | 5 | 49 | 9 | 19 | 5 | 8 |
| Illinois..... | 1 | 204 | 1 | 192 | 406 | 260 | 159 | 1 | 1 | 1 | (1) | (1) | 49 | 5 | 24 | 24 | 25 | 25 | 59 |
| Colorado..... | 30 | 21 | 545 | 55 | 77 | 33 | 81 | 7 | 7 | 1 | 33 | 55 | 49 | 33 | 49 | 25 | 25 | 25 | 59 |
| Nebraska..... | 25 | 172 | 268 | 339 | 441 | 165 | 165 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Minnesota..... | 24 | 237 | 237 | 4 | 25 | 1 | 108 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Iowa..... | 117 | 26 | 284 | 4 | 25 | 1 | 108 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Other States..... | 25,511 | 26,411 | 28,752 | 27,604 | 26,709 | 24,032 | 28,155 | 1,962 | 1,911 | 1,814 | 2,529 | 3,138 | 2,885 | 2,642 | 2,074 | 1,590 | 1,470 | 1,569 | 1,571 |
| Total..... | 82,659 | 86,921 | 82,476 | 83,243 | 84,617 | 87,324 | 81,183 | 6,091 | 5,259 | 5,915 | 6,656 | 9,216 | 10,787 | 11,063 | 7,812 | 5,922 | 4,652 | 4,030 | 3,780 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

1 Not over 500 pounds.

2 Totals include receipts from Canada as follows: Chicago, 215 in 1923 and 470 in 1925; Philadelphia, 252 in 1923, 391 in 1924, 173 in 1925; Boston, 137 in 1923, 29 in 1924, 1 in 1926, 5 in 1927; 2 in 1928; San Francisco, 316 in 1923, 326 in 1925.

TABLE 459.—*Butter: International trade, average 1909–1913, annual 1925–1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Average 1909–1913 | | 1925 | | 1926 | | 1927 | | 1928 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Denmark..... | 6,241 | 195,530 | 1,744 | 270,674 | 2,816 | 232,115 | 1,826 | 315,721 | 1,621 | 325,710 |
| New Zealand..... | 47 | 38,761 | 13 | 139,176 | 16 | 130,820 | 0 | 163,020 | 0 | 162,352 |
| Australia..... | 46 | 77,859 | 1 | 128,494 | 1 | 3,726 | 10,935 | 75,089 | ----- | 112,827 |
| Netherlands..... | 4,987 | 75,133 | 5,757 | 87,598 | 3,347 | 100,428 | 4,042 | 105,714 | 5,123 | 103,485 |
| Argentina..... | 113 | 0,934 | 6 | 59,282 | 15 | 64,234 | 3 | 46,808 | ----- | 44,182 |
| Irish Free State..... | 0 | 0 | 9,381 | 44,975 | 6,501 | 56,099 | 4,836 | 65,576 | 5,879 | 62,623 |
| Russia..... | 2,202 | 150,294 | 1 | 53,527 | 1 | 59,410 | 1 | 71,747 | ----- | 71,889 |
| Finland..... | 2,370 | 26,337 | 4 | 29,081 | 196 | 29,127 | 2 | 33,238 | ----- | 20,488 |
| Canada..... | 3,388 | 3,973 | 100 | 26,647 | 9,152 | 9,814 | 11,209 | 2,696 | 16,802 | 1,995 |
| Sweden..... | 330 | 45,870 | 406 | 20,333 | 79 | 33,353 | 63 | 40,707 | 93 | 38,679 |
| Latvia..... | 0 | 0 | 1 | 15,772 | 1 | 22,343 | 1 | 23,724 | ----- | 28,673 |
| Estonia..... | 0 | 0 | 0 | 14,208 | 0 | 10,161 | 0 | 21,839 | 0 | ----- |
| Italy..... | 972 | 7,870 | 259 | 8,009 | 153 | 5,679 | 2,085 | 2,805 | 3,565 | 1,779 |
| Spain..... | 939 | 259 | 295 | 583 | 309 | 408 | 1 | 337 | ----- | ----- |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 455,489 | 1,179 | 616,300 | 1,445 | 626,325 | 1,688 | 625,144 | 1,703 | 667,110 | 1,395 |
| Germany..... | 111,441 | 498 | 212,993 | 304 | 215,584 | 294 | 238,683 | 190 | 279,000 | 281 |
| France..... | 13,713 | 40,769 | 6,655 | 8,211 | 1,499 | 11,040 | 12,083 | 23,555 | 5,808 | 24,836 |
| Belgium..... | 14,024 | 3,125 | 9,191 | 871 | 5,013 | 1,899 | 2,559 | 2,957 | 2,808 | 3,671 |
| Switzerland..... | 11,106 | 44 | 19,092 | 177 | 17,818 | 31 | 18,727 | 159 | 18,061 | 150 |
| United States..... | 1,647 | 4,125 | 7,212 | 5,343 | 8,029 | 5,483 | 8,460 | 4,343 | 4,659 | 3,898 |
| Dutch East Indies..... | 4,152 | 0 | 7,321 | 0 | 10,115 | 0 | 9,170 | 0 | 8,231 | 0 |
| Greece..... | 206 | 8 | 1,914 | 0 | 1,009 | 0 | 1,625 | 0 | 1,172 | 0 |
| Czechoslovakia..... | 0 | 0 | 1,208 | 310 | 1,160 | 334 | 1,683 | 369 | 992 | 1,295 |
| Norway..... | 976 | 3,137 | 1,467 | 468 | 2,369 | 338 | 2,511 | 25 | 1,533 | 82 |
| Austria..... | 3 | 6,281 | 2,856 | 334 | 4,648 | 583 | 4,230 | 440 | 1,785 | 1,064 |
| Cuba..... | 1,459 | 0 | 2,655 | 0 | 2,169 | 0 | 1,878 | 0 | ----- | 40 |
| Egypt..... | 2,350 | 166 | 2,384 | 56 | 2,839 | 44 | 2,552 | 87 | 1,775 | 0 |
| China..... | 1,677 | 0 | 1,697 | 0 | 1,762 | 0 | 1,530 | 0 | 1,945 | 0 |
| Peru..... | 462 | 20 | 1,653 | 9 | 1,844 | 6 | 1,441 | 9 | 2,116 | 2 |
| Algeria..... | 1,946 | 9 | 1,830 | 32 | 1,507 | 53 | 1,224 | 148 | ----- | ----- |
| Philippine Islands..... | 1,665 | 0 | 991 | 0 | 1,188 | 0 | 1,072 | 0 | 1,412 | 0 |
| Trinidad and Tobago..... | 847 | 0 | 918 | 0 | 1,038 | 0 | 1,314 | 0 | ----- | ----- |
| Union of South Africa..... | 3,913 | 26 | 705 | 793 | 48 | 262 | 1,244 | 242 | 693 | 224 |
| Total 33 countries..... | 654,969 | 686,193 | 916,216 | 919,012 | 932,569 | 928,132 | 973,834 | 1,003,111 | 1,032,273 | 1,020,450 |

Bureau of Agricultural Economics. Official sources, except where otherwise noted. Butter includes all butter made from milk, melted and renovated butter, but does not include margarine, cocoa butter, or ghee.

¹ International Yearbook of Agricultural Statistics.

² Java and Madura only.

³ Average for Austria-Hungary.

⁴ 2-year average.

⁵ 4-year average.

TABLE 460.—*Butterfat: Estimated average, price per pound received by producers in the United States, 1921–1929*

| Year beginning May— | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | Weighted average |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------|
| | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> | <i>Cts.</i> |
| 1921..... | 29.7 | 27.6 | 31.6 | 36.8 | 36.2 | 40.0 | 40.6 | 39.9 | 33.4 | 34.0 | 34.5 | 33.4 | 34.0 |
| 1922..... | 33.4 | 33.9 | 34.8 | 32.8 | 35.5 | 39.2 | 44.2 | 50.3 | 47.0 | 44.9 | 44.9 | 46.0 | 39.3 |
| 1923..... | 40.3 | 36.9 | 36.7 | 38.7 | 42.2 | 44.1 | 47.8 | 49.2 | 50.6 | 48.5 | 46.4 | 40.8 | 42.4 |
| 1924..... | 37.6 | 37.1 | 37.8 | 35.8 | 36.6 | 36.6 | 37.0 | 41.1 | 40.6 | 37.9 | 41.5 | 40.5 | 38.1 |
| 1925..... | 40.3 | 39.9 | 40.5 | 41.3 | 42.6 | 47.1 | 47.8 | 47.6 | 45.2 | 43.1 | 42.9 | 40.4 | 42.6 |
| 1926..... | 39.1 | 39.3 | 38.6 | 38.6 | 40.5 | 42.4 | 44.8 | 47.9 | 46.9 | 46.8 | 48.0 | 47.1 | 42.5 |
| 1927..... | 43.6 | 40.8 | 40.3 | 39.4 | 41.6 | 44.4 | 45.8 | 47.8 | 48.5 | 46.0 | 46.5 | 45.4 | 43.6 |
| 1928..... | 44.4 | 43.5 | 43.3 | 44.3 | 46.5 | 47.0 | 47.6 | 49.2 | 47.6 | 47.8 | 48.3 | 46.5 | 45.8 |
| 1929..... | 45.4 | 43.6 | 43.4 | 43.3 | 44.6 | 45.6 | 43.5 | 41.9 | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Quotations cover butterfat for all uses. Based on reports of special price reporters. Monthly prices weighted by number of milk cows Jan. 1, by States; yearly price obtained by weighting monthly prices by production of creamery butter.

TABLE 461.—Butter, 92-score creamery: Average wholesale price, at leading markets, specified years

NEW YORK

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1910..... | 33 | 36 | 33 | 31 | 28 | 28 | 28 | 29 | 30 | 30 | 31 | 30 | 30 |
| 1911..... | 26 | 26 | 24 | 21 | 22 | 23 | 25 | 26 | 27 | 30 | 34 | 37 | 27 |
| 1912..... | 39 | 32 | 31 | 33 | 30 | 27 | 27 | 27 | 30 | 31 | 34 | 37 | 32 |
| 1913..... | 35 | 36 | 37 | 36 | 29 | 28 | 27 | 28 | 32 | 31 | 34 | 36 | 32 |
| 1914..... | 33 | 29 | 28 | 25 | 26 | 27 | 28 | 30 | 31 | 32 | 35 | 34 | 30 |
| 1915..... | 34 | 32 | 30 | 31 | 29 | 28 | 27 | 26 | 27 | 29 | 31 | 35 | 30 |
| 1916..... | 33 | 34 | 37 | 36 | 31 | 30 | 29 | 31 | 34 | 35 | 39 | 40 | 34 |
| 1917..... | 40 | 44 | 42 | 44 | 40 | 39 | 39 | 41 | 44 | 45 | 46 | 50 | 43 |
| 1918..... | 52 | 50 | 44 | 42 | 42 | 44 | 45 | 46 | 56 | 58 | 63 | 69 | 51 |
| 1919..... | 62 | 52 | 62 | 64 | 58 | 52 | 53 | 55 | 59 | 68 | 71 | 72 | 61 |
| 1920..... | 65 | 66 | 67 | 71 | 61 | 57 | 57 | 55 | 59 | 60 | 63 | 56 | 61 |
| 1921..... | 52 | 47 | 48 | 46 | 32 | 33 | 40 | 43 | 43 | 47 | 45 | 44 | 43 |
| 1922..... | 37 | 37 | 38 | 38 | 38 | 37 | 36 | 35 | 41 | 46 | 51 | 54 | 41 |
| 1923..... | 52 | 50 | 49 | 46 | 42 | 39 | 39 | 44 | 46 | 48 | 53 | 55 | 47 |
| 1924..... | 53 | 50 | 47 | 38 | 39 | 41 | 40 | 38 | 38 | 39 | 43 | 45 | 43 |
| 1925..... | 40 | 41 | 48 | 45 | 43 | 42 | 43 | 43 | 48 | 51 | 51 | 49 | 45 |
| 1926..... | 45 | 45 | 43 | 39 | 41 | 41 | 40 | 42 | 45 | 47 | 51 | 55 | 44 |
| 1927..... | 49 | 52 | 50 | 50 | 43 | 43 | 42 | 42 | 46 | 48 | 50 | 52 | 47 |
| 1928..... | 49 | 47 | 49 | 45 | 45 | 44 | 45 | 47 | 49 | 48 | 51 | 50 | 47 |
| 1929..... | 48 | 50 | 48 | 45 | 44 | 44 | 42 | 43 | 46 | 46 | 43 | 41 | 45 |

CHICAGO

| | | | | | | | | | | | | | |
|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1927..... | 48 | 50 | 49 | 48 | 41 | 40 | 40 | 41 | 45 | 46 | 48 | 51 | 46 |
| 1928..... | 47 | 46 | 48 | 44 | 43 | 43 | 44 | 46 | 47 | 46 | 49 | 49 | 46 |
| 1929..... | 47 | 49 | 48 | 44 | 42 | 42 | 41 | 42 | 45 | 44 | 41 | 39 | 44 |

SAN FRANCISCO

| | | | | | | | | | | | | | |
|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1927..... | 47 | 48 | 45 | 42 | 41 | 42 | 42 | 44 | 47 | 48 | 49 | 48 | 45 |
| 1928..... | 46 | 45 | 43 | 40 | 42 | 43 | 46 | 48 | 50 | 51 | 49 | 50 | 46 |
| 1929..... | 46 | 47 | 45 | 43 | 45 | 45 | 45 | 46 | 49 | 48 | 48 | 42 | 46 |

PHILADELPHIA

| | | | | | | | | | | | | | |
|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1927..... | 50 | 52 | 51 | 51 | 44 | 43 | 43 | 43 | 47 | 40 | 51 | 53 | 48 |
| 1928..... | 50 | 48 | 50 | 46 | 46 | 45 | 46 | 44 | 50 | 49 | 52 | 51 | 48 |
| 1929..... | 49 | 51 | 49 | 46 | 45 | 45 | 43 | 44 | 47 | 47 | 44 | 42 | 46 |

BOSTON

| | | | | | | | | | | | | | |
|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1927..... | 50 | 52 | 51 | 51 | 44 | 43 | 42 | 42 | 46 | 48 | 48 | 50 | 47 |
| 1928..... | 49 | 47 | 50 | 46 | 45 | 44 | 45 | 47 | 49 | 48 | 50 | 50 | 48 |
| 1929..... | 48 | 50 | 49 | 46 | 44 | 44 | 43 | 44 | 46 | 46 | 43 | 41 | 45 |

Bureau of Agricultural Economics. Compiled from Urner-Barry reports, 1910-1917 (New York), average of daily range; subsequently from reports of bureau representatives in the markets. Earlier data available in 1925 Yearbook, p. 1094, Table 501, and 1927 Yearbook, p. 1082.

TABLE 462.—*Butter: Average export price per pound in Copenhagen, Denmark, 1914-1929*

| Year | Jan. | Feb. | | | | | | | | | Nov. | Dec. | Average |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1914 | 26.1 | 25.6 | 25.6 | 24.1 | 23.4 | 23.9 | 25.9 | 24.4 | 25.0 | 27.8 | 27.3 | 29.9 | 28.8 |
| 1915 | 29.6 | 26.9 | 28.0 | 27.6 | 29.0 | 29.1 | 31.0 | 32.0 | 31.7 | 31.6 | 40.5 | 36.6 | 32.3 |
| 1916 | 33.8 | 35.4 | 37.8 | 36.8 | 36.3 | 35.7 | 36.7 | 40.1 | 42.1 | 42.6 | 44.3 | 44.9 | 38.9 |
| 1917 | 45.3 | 39.6 | 38.4 | 37.2 | 38.6 | 40.5 | 45.0 | 49.7 | 54.6 | 65.4 | 68.4 | 65.5 | 49.0 |
| 1918 | 64.2 | 63.7 | 64.0 | 65.0 | 65.3 | 64.7 | 65.1 | 65.0 | 62.0 | 58.3 | 75.6 | 76.0 | 65.7 |
| 1919 | 75.8 | 73.8 | 72.4 | 71.1 | 58.2 | 60.8 | 48.4 | 46.5 | 64.7 | 53.8 | 59.5 | 52.1 | 59.8 |
| 1920 | 48.9 | 42.1 | 49.2 | 49.8 | 44.2 | 44.8 | 42.4 | 42.9 | 43.6 | 45.7 | 44.7 | 44.0 | 45.2 |
| 1921 | 42.4 | 39.3 | 40.4 | 43.9 | 33.5 | 32.4 | 38.3 | 41.1 | 36.4 | 38.3 | 39.9 | 31.8 | 38.1 |
| 1922 | 31.1 | 31.0 | 32.9 | 33.8 | 33.5 | 37.0 | 39.4 | 39.1 | 41.1 | 40.7 | 39.9 | 39.7 | 36.6 |
| 1923 | 40.5 | 41.3 | 41.0 | 34.5 | 29.5 | 29.3 | 30.7 | 34.7 | 40.3 | 38.9 | 39.4 | 41.4 | 36.8 |
| 1924 | 40.0 | 39.5 | 36.9 | 31.3 | 36.4 | 33.4 | 37.8 | 41.1 | 42.3 | 46.1 | 44.2 | 46.8 | 39.6 |
| 1925 | 42.0 | 45.4 | 46.1 | 40.6 | 36.9 | 39.4 | 40.5 | 44.2 | 45.7 | 46.5 | 44.6 | 37.8 | 42.5 |
| 1926 | 36.5 | 40.2 | 38.8 | 36.2 | 34.8 | 35.7 | 35.4 | 36.1 | 36.6 | 36.3 | 34.9 | 37.1 | 36.6 |
| 1927 | 36.4 | 39.3 | 36.8 | 35.2 | 32.9 | 33.2 | 32.2 | 35.0 | 39.6 | 39.4 | 41.2 | 38.0 | 36.6 |
| 1928 | 35.4 | 37.5 | 40.0 | 36.8 | 35.4 | 34.9 | 36.4 | 38.0 | 40.2 | 39.5 | 40.6 | 42.4 | 38.1 |
| 1929 | 39.1 | 39.0 | 35.5 | 32.8 | 33.4 | 35.1 | 35.3 | 35.6 | 39.7 | 40.5 | 38.7 | 35.8 | 36.7 |

Bureau of Agricultural Economics. Danish Butter Journal (Smør Tidende) official quotations. For earlier years, 1882-1913, see the United States Department of Agriculture Yearbook, 1923, p. 923.

Conversion from Danish quotations in ore per pound (1.1023 pounds) at par of exchange (100 ore = 26.8 cents) to July, 1914; beginning July, 1914, to December, 1926, inclusive, from weekly quotations in kroner per 100 kg., at average monthly exchange rate as quoted by Federal Reserve Board. Beginning January, 1927, to date at par of exchange.

TABLE 463.—*Cheese, whole milk American Cheddar: Production in the United States, 1917-1928*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| 1917 | 8,519 | 9,415 | 11,918 | 17,577 | 28,932 | 38,796 | 35,296 | 32,248 | 37,613 | 22,303 | 14,262 | 8,070 | 264,940 |
| 1918 | 8,143 | 7,860 | 11,992 | 17,931 | 31,285 | 40,184 | 34,332 | 29,996 | 25,424 | 18,862 | 12,172 | 9,097 | 247,778 |
| 1919 | 12,065 | 12,964 | 20,118 | 22,751 | 35,958 | 45,708 | 36,574 | 32,049 | 27,366 | 24,223 | 14,216 | 11,152 | 295,144 |
| 1920 | 10,457 | 11,509 | 14,954 | 18,856 | 29,832 | 41,376 | 34,313 | 26,787 | 22,935 | 20,054 | 13,308 | 10,303 | 254,684 |
| 1921 | 11,889 | 12,857 | 17,678 | 23,521 | 34,556 | 36,444 | 26,977 | 27,652 | 23,612 | 21,496 | 13,426 | 11,618 | 261,726 |
| 1922 | 12,837 | 13,927 | 18,774 | 21,740 | 31,349 | 36,254 | 33,265 | 29,496 | 25,581 | 25,785 | 18,382 | 15,416 | 282,806 |
| 1923 | 15,092 | 15,326 | 20,184 | 24,014 | 32,942 | 41,382 | 38,288 | 31,822 | 28,648 | 25,560 | 18,236 | 16,608 | 308,108 |
| 1924 | 17,718 | 18,886 | 22,955 | 24,597 | 33,657 | 43,517 | 40,716 | 33,602 | 30,539 | 26,210 | 17,252 | 15,046 | 324,695 |
| 1925 | 16,834 | 17,991 | 21,598 | 26,889 | 38,012 | 45,782 | 43,706 | 37,659 | 31,548 | 28,253 | 20,349 | 18,619 | 347,240 |
| 1926 | 19,519 | 19,984 | 25,216 | 29,221 | 38,598 | 46,320 | 40,164 | 33,239 | 28,809 | 23,164 | 16,386 | 15,295 | 338,915 |
| 1927 | 16,660 | 17,085 | 21,318 | 24,533 | 34,704 | 41,489 | 38,195 | 31,944 | 25,788 | 23,012 | 16,717 | 16,337 | 307,777 |
| 1928 | 18,010 | 19,005 | 23,451 | 28,221 | 37,324 | 45,012 | 40,072 | 34,229 | 30,342 | 25,134 | 18,013 | 16,440 | 335,253 |

Bureau of Agricultural Economics.

TABLE 464.—*Cheese, whole-milk American Cheddar: Production, United States, by States, 1919-1928*

| State | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|-------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Vermont..... | 2,960 | 1,382 | 1,380 | 954 | 1,200 | 1,755 | 1,120 | 1,114 | 629 | 603 |
| Other New England States..... | 12 | 3 | 79 | ----- | ----- | 34 | 6 | 128 | 96 | 147 |
| New England..... | 2,972 | 1,385 | 1,459 | 954 | 1,200 | 1,789 | 1,126 | 1,242 | 725 | 750 |
| New York..... | 46,510 | 30,829 | 37,970 | 47,726 | 37,448 | 36,608 | 38,401 | 31,663 | 24,931 | 31,075 |
| New Jersey..... | 446 | 130 | ----- | 634 | 196 | 155 | ----- | ----- | ----- | ----- |
| Pennsylvania..... | 2,928 | 2,673 | 3,208 | 2,209 | 2,497 | 1,750 | 1,349 | 1,681 | 1,750 | 2,196 |
| Middle Atlantic..... | 49,894 | 33,632 | 41,178 | 50,569 | 40,141 | 38,513 | 39,750 | 33,344 | 26,681 | 33,271 |
| Ohio..... | 963 | 659 | 654 | 195 | 128 | 366 | 253 | 269 | 303 | 936 |
| Indiana..... | 70 | 42 | 117 | 62 | 78 | 306 | 198 | 234 | 701 | 4,969 |
| Illinois..... | 2,538 | 999 | 1,751 | 2,401 | 2,875 | 2,498 | 2,444 | 2,902 | 2,836 | 4,115 |
| Michigan..... | 5,188 | 4,032 | 5,064 | 3,657 | 4,342 | 5,867 | 5,844 | 6,827 | 5,906 | 7,724 |
| Wisconsin..... | 201,836 | 188,548 | 182,777 | 193,376 | 226,916 | 235,186 | 258,684 | 248,059 | 227,447 | 221,775 |
| East North Central..... | 210,595 | 194,280 | 190,363 | 199,691 | 234,339 | 244,223 | 267,423 | 258,291 | 237,193 | 230,519 |
| Minnesota..... | 8,998 | 5,502 | 5,693 | 5,291 | 7,229 | 9,790 | 8,419 | 8,984 | 7,556 | 9,163 |
| Iowa..... | 859 | 545 | 313 | 344 | 361 | 530 | 501 | 383 | 410 | 661 |
| Missouri..... | 302 | 380 | 382 | 96 | 224 | 105 | 252 | 312 | 484 | 2,377 |
| Others..... | 97 | 31 | 141 | 190 | 186 | 354 | 477 | 912 | 1,301 | 4,973 |
| West North Central..... | 10,256 | 6,458 | 6,520 | 5,921 | 8,000 | 10,779 | 9,649 | 10,591 | 9,751 | 17,174 |
| South Atlantic..... | 387 | 220 | 184 | 226 | 277 | 276 | 155 | 110 | 164 | 754 |
| Tennessee..... | 51 | 26 | 50 | 71 | 24 | 398 | 321 | 172 | 154 | 650 |
| Others..... | ----- | ----- | 29 | ----- | 51 | ----- | 37 | ----- | 15 | 3,605 |
| East South Central..... | 51 | 26 | 79 | 71 | 335 | 398 | 358 | 172 | 160 | 4,255 |
| West South Central..... | 3 | ----- | 15 | 51 | ----- | 37 | ----- | 5 | ----- | 1,433 |
| Wyoming..... | 1,612 | 1,180 | 1,543 | 3,416 | 1,791 | 1,883 | 1,923 | 2,118 | 2,067 | 2,185 |
| Idaho..... | 2,578 | 1,722 | 2,117 | 3,368 | 5,311 | 7,343 | 7,320 | 7,986 | 7,434 | 7,718 |
| Utah..... | 907 | 849 | 1,027 | 3,219 | 2,139 | 2,162 | 1,753 | 1,809 | 2,205 | 2,592 |
| Montana..... | 269 | 233 | 113 | 259 | 641 | 792 | 1,296 | 1,484 | 1,435 | 2,347 |
| Others..... | 476 | 231 | 529 | 187 | 318 | 701 | 482 | 650 | 1,390 | 3,101 |
| Mountain..... | 5,842 | 4,215 | 5,329 | 10,449 | 10,200 | 12,881 | 12,774 | 14,047 | 14,531 | 17,943 |
| Washington..... | 1,145 | 1,143 | 1,910 | 2,928 | 2,762 | 2,998 | 3,076 | 3,130 | 2,924 | 4,051 |
| Oregon..... | 8,348 | 8,282 | 8,777 | 8,720 | 7,678 | 9,951 | 9,903 | 11,517 | 11,435 | 11,051 |
| California..... | 5,661 | 5,043 | 5,904 | 3,226 | 3,082 | 2,850 | 3,026 | 3,466 | 4,204 | 5,052 |
| Pacific..... | 15,154 | 14,468 | 16,591 | 14,874 | 13,522 | 15,799 | 16,005 | 18,113 | 18,563 | 20,154 |
| Total..... | 295,144 | 254,684 | 261,727 | 282,806 | 308,014 | 324,695 | 347,240 | 335,915 | 307,777 | 335,253 |

Bureau of Agricultural Economics. The compilations are made from reports of factories to the bureau.

TABLE 465.—*Cheese: Receipts, gross weight, at five markets, specified years*

NEW YORK

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| 1927 | 2,817 | 2,844 | 3,284 | 3,505 | 3,502 | 4,814 | 5,228 | 4,824 | 5,108 | 4,398 | 3,367 | 3,216 | 46,937 |
| 1928 | 3,035 | 3,403 | 3,944 | 4,017 | 4,158 | 4,865 | 4,495 | 4,326 | 4,085 | 4,476 | 3,408 | 3,400 | 48,272 |
| 1929 | 3,725 | 3,854 | 4,066 | 3,095 | 4,576 | 5,218 | 5,588 | 5,074 | 4,534 | 3,858 | 3,502 | 3,821 | 50,911 |

CHICAGO

| | | | | | | | | | | | | | |
|------|-------|-------|-------|--------|--------|--------|--------|--------|--------|-------|-------|-------|---------|
| 1927 | 7,170 | 9,104 | 9,145 | 10,210 | 13,263 | 11,940 | 13,139 | 12,557 | 11,915 | 9,918 | 7,487 | 7,785 | 123,633 |
| 1928 | 7,713 | 7,184 | 7,401 | 7,615 | 7,626 | 9,152 | 10,792 | 9,450 | 9,108 | 8,639 | 6,930 | 5,654 | 97,264 |
| 1929 | 7,262 | 7,134 | 5,511 | 5,619 | 7,972 | 8,257 | 9,048 | 8,542 | 6,641 | 6,053 | 4,585 | 4,199 | 80,823 |

PHILADELPHIA

| | | | | | | | | | | | | | |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 1927 | 1,140 | 1,409 | 1,047 | 1,290 | 2,041 | 2,357 | 2,409 | 1,899 | 2,027 | 2,183 | 1,362 | 1,232 | 20,396 |
| 1928 | 1,285 | 1,261 | 1,343 | 1,312 | 1,796 | 2,092 | 2,821 | 1,752 | 2,060 | 2,405 | 1,0 | 1,173 | 21,039 |
| 1929 | 1,220 | 1,198 | 1,190 | 1,602 | 1,957 | 1,616 | 2,265 | 1,786 | 2,023 | 2,105 | 1,8 | 1,171 | 19,973 |

BOSTON

| | | | | | | | | | | | | | |
|------|-----|-------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-----|--------|
| 1927 | 834 | 857 | 694 | 796 | 1,211 | 1,654 | 1,736 | 1,919 | 1,347 | 1,466 | 1,162 | 912 | 14,588 |
| 1928 | 808 | 1,631 | 991 | 1,113 | 1,587 | 1,884 | 1,930 | 2,048 | 1,607 | 2,154 | 1,281 | 818 | 17,362 |
| 1929 | 639 | 978 | 709 | 997 | 1,232 | 1,978 | 2,365 | 1,837 | 1,108 | 1,222 | 917 | 919 | 14,869 |

SAN FRANCISCO

| | | | | | | | | | | | | | |
|------|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-----|-----|--------|
| 1927 | 716 | 702 | 786 | 1,121 | 1,284 | 1,360 | 1,622 | 1,367 | 1,125 | 1,031 | 900 | 681 | 12,694 |
| 1928 | 808 | 836 | 975 | 1,062 | 1,080 | 1,223 | 1,683 | 1,152 | 1,326 | 991 | 867 | 647 | 12,676 |
| 1929 | 935 | 713 | 785 | 1,018 | 1,013 | 1,337 | 1,284 | 1,366 | 983 | 1,105 | 985 | 769 | 12,293 |

TOTAL

| | | | | | | | | | | | | | |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| 1918 | | | | | | | 20,536 | 16,112 | 12,383 | 13,796 | 10,398 | 11,292 | |
| 1919 | 10,988 | 10,271 | 13,386 | 15,362 | 20,069 | 22,648 | 22,267 | 18,417 | 18,519 | 18,491 | 14,650 | 12,199 | 197,267 |
| 1920 | 11,094 | 9,655 | 13,918 | 8,583 | 16,140 | 21,874 | 19,797 | 16,416 | 12,831 | 12,924 | 13,802 | 11,633 | 168,667 |
| 1921 | 11,488 | 11,283 | 12,758 | 13,952 | 19,361 | 21,680 | 19,324 | 15,999 | 14,923 | 16,653 | 13,228 | 10,973 | 181,622 |
| 1922 | 10,734 | 11,258 | 14,789 | 15,565 | 19,146 | 22,770 | 20,211 | 19,809 | 17,463 | 18,323 | 15,699 | 14,071 | 199,835 |
| 1923 | 13,063 | 12,617 | 15,354 | 16,433 | 18,963 | 25,406 | 25,764 | 21,690 | 18,619 | 21,325 | 16,557 | 13,256 | 219,037 |
| 1924 | 13,899 | 16,092 | 16,540 | 16,175 | 19,030 | 22,041 | 25,143 | 19,996 | 18,855 | 17,479 | 14,884 | 14,922 | 215,056 |
| 1925 | 15,202 | 12,845 | 14,808 | 15,436 | 18,529 | 24,025 | 25,825 | 24,176 | 20,520 | 21,029 | 17,059 | 14,012 | 223,556 |
| 1926 | 14,853 | 13,568 | 15,055 | 15,531 | 14,972 | 21,777 | 21,973 | 20,736 | 18,784 | 18,699 | 15,954 | 15,986 | 207,888 |
| 1927 | 12,707 | 14,916 | 14,956 | 16,922 | 21,301 | 22,134 | 24,134 | 22,556 | 21,522 | 18,698 | 14,278 | 13,826 | 218,248 |
| 1928 | 14,409 | 13,715 | 14,654 | 15,139 | 16,253 | 19,216 | 21,741 | 18,728 | 18,222 | 18,665 | 14,179 | 11,692 | 196,613 |
| 1929 | 13,781 | 13,877 | 12,261 | 12,331 | 16,750 | 18,406 | 20,548 | 18,605 | 15,289 | 14,343 | 11,829 | 10,879 | 178,899 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets. See 1927 Yearbook, p. 1084, for data for earlier years.

DAIRY AND POULTRY

TABLE 466.—*Cheese: Receipts, gross weight, at five markets, by State of origin, 1921-1929*

NEW YORK

| State of origin | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| New York..... | 22,413 | 21,770 | 16,909 | 14,478 | 14,107 | 11,180 | 11,867 | 13,390 | 11,252 |
| Wisconsin..... | 17,044 | 16,100 | 19,758 | 16,339 | 18,978 | 17,587 | 19,258 | 23,002 | 27,068 |
| Illinois..... | 7,061 | 6,997 | 8,535 | 8,382 | 7,211 | 7,406 | 7,231 | 5,132 | 4,497 |
| Pennsylvania..... | 1,623 | 1,181 | 955 | 618 | 1,105 | 745 | 434 | 745 | 588 |
| Michigan..... | 787 | 506 | 619 | 644 | 472 | 301 | 440 | 837 | 937 |
| Ohio..... | 773 | 632 | 321 | 136 | 374 | 363 | 587 | 646 | 678 |
| Massachusetts..... | 420 | 189 | 228 | 235 | 248 | 244 | 189 | 64 | 365 |
| Indiana..... | 187 | 182 | 277 | 581 | 2,075 | 5,653 | 3,833 | 1,923 | 1,585 |
| Nebraska..... | 144 | 23 | 4 | 240 | 48 | 76 | 150 | 42 | 52 |
| Missouri..... | 131 | 315 | 170 | 48 | 98 | 158 | 287 | 123 | 7 |
| Minnesota..... | 112 | 494 | 249 | 352 | 118 | 551 | 270 | 179 | 188 |
| New Jersey..... | 97 | 46 | 40 | 48 | 16 | 18 | 204 | 180 | 69 |
| Iowa..... | 57 | 94 | 206 | 245 | 777 | 346 | 421 | 178 | 82 |
| Virginia..... | 24 | 5 | 4 | 49 | 23 | 12 | 3 | 24 | 220 |
| Tennessee..... | 15 | 74 | 3 | 8 | 15 | 13 | 1 | 34 | 15 |
| Vermont..... | 14 | 97 | 305 | 79 | 273 | 47 | 3 | 16 | 33 |
| Other States..... | 625 | 215 | 414 | 172 | 85 | 78 | 279 | 214 | 357 |
| Canada..... | 454 | 1,189 | 428 | 255 | 140 | 585 | 1,471 | 1,537 | 2,918 |
| Total..... | 51,981 | 50,109 | 49,425 | 42,950 | 46,163 | 45,363 | 46,937 | 48,272 | 50,911 |

BOSTON

| | | | | | | | | | |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| New York..... | 5,868 | 6,527 | 7,402 | 5,209 | 4,546 | 4,328 | 2,831 | 3,787 | 2,847 |
| Wisconsin..... | 3,294 | 3,091 | 3,392 | 4,317 | 7,787 | 6,229 | 7,170 | 9,953 | 9,260 |
| Illinois..... | 1,782 | 2,091 | 3,881 | 2,931 | 1,782 | 3,622 | 3,261 | 1,845 | 1,754 |
| Vermont..... | 1,444 | 471 | 623 | 736 | 432 | 413 | 124 | 47 | 34 |
| Pennsylvania..... | 132 | 136 | 183 | 181 | 206 | 152 | 197 | 56 | 10 |
| Ohio..... | 71 | 35 | 23 | 137 | 201 | 162 | 196 | 110 | 6 |
| New Hampshire..... | 55 | 75 | 50 | 41 | 6 | 5 | 2 | 2 | 1 |
| Massachusetts..... | 39 | 32 | 27 | 13 | 8 | 5 | 41 | 65 | 37 |
| Indiana..... | 36 | 66 | 28 | 1 | 47 | 60 | 170 | 388 | 161 |
| Maine..... | 35 | 17 | 38 | 5 | 4 | 114 | 143 | 147 | 1 |
| Michigan..... | 31 | 296 | 191 | 74 | 198 | 184 | 200 | 422 | 322 |
| Other States..... | 142 | 475 | 71 | 23 | 97 | 162 | 221 | 353 | 407 |
| Canada..... | 279 | 209 | 5 | 56 | ----- | 1 | 32 | 187 | 59 |
| Total..... | 13,208 | 13,521 | 15,914 | 13,724 | 15,314 | 15,437 | 14,588 | 17,362 | 14,899 |

CHICAGO

| | | | | | | | | | |
|-------------------|--------|---------|---------|---------|---------|---------|---------|--------|--------|
| Wisconsin..... | 76,706 | 95,656 | 110,648 | 117,439 | 119,244 | 100,676 | 109,504 | 82,954 | 67,495 |
| Illinois..... | 3,102 | 4,011 | 4,497 | 3,965 | 4,592 | 3,233 | 2,996 | 2,900 | 1,994 |
| Minnesota..... | 2,687 | 1,990 | 3,177 | 2,733 | 3,108 | 3,265 | 2,503 | 2,979 | 2,999 |
| Michigan..... | 1,687 | 1,415 | 729 | 1,241 | 118 | 238 | 550 | 137 | 192 |
| Montana..... | 313 | 26 | 203 | 311 | 81 | ----- | 66 | ----- | 1 |
| Iowa..... | 287 | 810 | 705 | 620 | 606 | 457 | 263 | 296 | 278 |
| New York..... | 221 | 2,391 | 2,429 | 1,667 | 1,282 | 2,218 | 3,480 | 4,246 | 4,652 |
| Kansas..... | 166 | 3 | 51 | 30 | 45 | 72 | 26 | 36 | 35 |
| Pennsylvania..... | 163 | 308 | 289 | 158 | 115 | 112 | 532 | 479 | 230 |
| California..... | 113 | 57 | ----- | ----- | 9 | 94 | 3 | 45 | 56 |
| Ohio..... | 99 | 301 | 147 | 91 | 745 | 315 | 532 | 176 | 111 |
| South Dakota..... | 78 | 17 | 16 | 64 | 2 | 106 | 138 | 9 | 29 |
| Missouri..... | 56 | 222 | 83 | 188 | 65 | 43 | 122 | 583 | 181 |
| Texas..... | 32 | 9 | 15 | 2 | 38 | 35 | 12 | 15 | 6 |
| Colorado..... | 27 | 104 | 16 | 34 | 192 | 42 | 31 | 58 | 197 |
| Indiana..... | 16 | 22 | 66 | 50 | 49 | 93 | 43 | 255 | 296 |
| Utah..... | 11 | 8 | 14 | 7 | 8 | 2 | 36 | 1 | ----- |
| New Jersey..... | ----- | 45 | 24 | 95 | 32 | ----- | 41 | 445 | 780 |
| Idaho..... | ----- | 19 | 108 | 675 | 337 | 534 | 88 | 26 | ----- |
| Other States..... | 85 | 90 | 122 | 281 | 81 | 250 | 916 | 1,057 | 685 |
| Canada..... | ----- | 250 | 246 | 373 | 330 | 3,259 | 1,742 | 567 | 606 |
| Total..... | 85,849 | 107,724 | 123,645 | 130,024 | 131,129 | 115,104 | 123,633 | 97,264 | 80,823 |

TABLE 466.—*Cheese: Receipts, gross weight, at five markets, by State of origin, 1921-1929—Continued*

PHILADELPHIA

| State of origin | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|-------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Wisconsin..... | 8,487 | 10,638 | 8,884 | 8,003 | 10,850 | 11,428 | 12,723 | 14,735 | 13,825 |
| New York..... | 7,068 | 4,660 | 4,538 | 3,655 | 3,427 | 2,630 | 2,462 | 2,201 | 2,145 |
| Illinois..... | 2,557 | 2,955 | 4,126 | 4,333 | 4,073 | 4,636 | 3,704 | 2,701 | 3,075 |
| Pennsylvania..... | 2,041 | 517 | 245 | 240 | 84 | 63 | 41 | 4 | 57 |
| Ohio..... | 205 | 223 | 136 | 26 | 11 | 133 | 86 | 82 | 52 |
| New Jersey..... | 121 | 14 | 36 | 3 | 3 | | 9 | 74 | |
| Indiana..... | 100 | 95 | 142 | 95 | 201 | 122 | 115 | 110 | 137 |
| Michigan..... | 45 | 115 | 131 | 199 | 111 | 188 | 634 | 409 | 539 |
| Minnesota..... | 41 | 1 | 54 | | 68 | 184 | 416 | 343 | 23 |
| Iowa..... | 3 | 25 | 44 | 164 | 37 | 1 | 3 | 2 | 4 |
| Other States..... | 284 | 73 | 27 | | 30 | 60 | 77 | 122 | 41 |
| Canada..... | | | | | | | 126 | 166 | 75 |
| Total..... | 20,952 | | | | | | 306 | 21,039 | 19,973 |

SAN FRANCISCO

| | | | | | | | | | |
|-------------------|-------|-------|--------|--------|--------|--------|--------|--------|------------------|
| California..... | 4,800 | 3,416 | 3,650 | 2,603 | 2,316 | 2,123 | 2,515 | 3,508 | 3,449 |
| Oregon..... | 2,245 | 2,448 | 2,557 | 2,710 | 3,029 | 3,148 | 3,273 | 2,877 | 3,374 |
| Wisconsin..... | 1,064 | 1,353 | 1,979 | 2,216 | 1,987 | 2,694 | 2,198 | 1,820 | 1,136 |
| Illinois..... | 505 | 855 | 1,441 | 821 | 463 | 222 | 192 | 91 | 3 |
| New York..... | 388 | 314 | 249 | 310 | 307 | 529 | 596 | 572 | 734 |
| Colorado..... | 176 | 322 | 222 | 256 | 323 | 294 | 241 | 225 | 179 |
| Washington..... | 145 | 108 | 112 | 58 | 120 | 50 | 91 | 17 | 17 |
| Idaho..... | 139 | 222 | 1,039 | 2,262 | 2,835 | 2,858 | 3,331 | 3,334 | 3,303 |
| Utah..... | 24 | 10 | 17 | 76 | 164 | 387 | 199 | 30 | 59 |
| Montana..... | | 56 | 338 | 5 | 64 | 79 | 1 | 160 | 3 |
| Minnesota..... | | | 63 | 152 | 154 | 94 | 24 | | (¹) |
| Other States..... | 146 | 53 | 23 | 13 | 93 | 52 | 33 | 42 | 36 |
| Total..... | 9,632 | 9,157 | 11,600 | 11,482 | 11,855 | 12,530 | 12,694 | 12,676 | 12,293 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

¹ Not over 500 pounds.

TABLE 467.—*American cheese:¹ Cold-storage holdings, United States, 1915-1929²*

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|-----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> | <i>1,000 lbs.</i> |
| 1915..... | | | | | | | | | 28,575 | 24,144 | 32,428 | 31,271 |
| 1916..... | 28,558 | 18,908 | 13,373 | 8,443 | 6,546 | 7,301 | 16,357 | 31,569 | 46,770 | 49,579 | 45,713 | 37,060 |
| 1917..... | 31,855 | 22,113 | 15,560 | 9,842 | 7,928 | 11,626 | 34,159 | 67,595 | 91,545 | 90,671 | 78,087 | 75,166 |
| 1918..... | 66,784 | 56,298 | 37,743 | 27,965 | 17,736 | 20,395 | 30,054 | 48,804 | 55,742 | 42,065 | 33,402 | 25,625 |
| 1919..... | 19,823 | 15,496 | 9,837 | 6,750 | 6,027 | 12,478 | 37,501 | 62,645 | 76,661 | 81,359 | 72,889 | 62,495 |
| 1920..... | 53,168 | 43,631 | 34,039 | 23,431 | 16,963 | 13,502 | 29,654 | 51,512 | 60,372 | 55,007 | 48,566 | 36,921 |
| 1921..... | 34,115 | 25,000 | 17,477 | 14,294 | 13,466 | 17,814 | 34,948 | 41,284 | 46,635 | 45,163 | 42,969 | 34,055 |
| 1922..... | 27,691 | 21,430 | 15,006 | 10,745 | 10,868 | 15,481 | 33,130 | 46,580 | 53,625 | 49,473 | 40,852 | 37,291 |
| 1923..... | 33,617 | 26,593 | 20,693 | 14,465 | 14,077 | 17,507 | 36,834 | 55,839 | 63,960 | 62,384 | 57,927 | 55,105 |
| 1924..... | 49,566 | 40,506 | 35,160 | 28,294 | 26,202 | 27,172 | 45,239 | 65,864 | 76,406 | 73,153 | 67,905 | 58,605 |
| 1925..... | 49,187 | 41,552 | 34,647 | 27,716 | 26,147 | 29,550 | 46,468 | 66,634 | 76,512 | 78,582 | 71,913 | 66,495 |
| 1926..... | 58,457 | 50,339 | 42,587 | 38,041 | 35,597 | 39,346 | 54,069 | 73,681 | 81,297 | 77,646 | 72,491 | 63,881 |
| 1927..... | 54,596 | 46,026 | 39,362 | 35,193 | 32,487 | 35,826 | 49,999 | 67,091 | 69,749 | 65,453 | 60,035 | 53,447 |
| 1928..... | 47,765 | 41,793 | 36,710 | 31,887 | 30,207 | 36,716 | 53,646 | 73,088 | 83,906 | 81,833 | 82,818 | 74,325 |
| 1929..... | 68,075 | 57,764 | 49,546 | 45,106 | 42,032 | 47,641 | 62,737 | 79,907 | 86,558 | 84,815 | 78,058 | 71,065 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

¹ Quantities given are net weight.

² The term "American cheese" is intended to cover only those varieties known as twins, flats, daisies, Cheddars, longhorns, and square prints. It does not, therefore, include all kinds of cheese made in America.

TABLE 468.—*Cheese: International trade, average 1909–1913, annual 1925–1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Average 1909–1913 | | 1925 | | 1926 | | 1927 | | 1928 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Netherlands..... | 522 | 127, 379 | 1, 163 | 175, 711 | 1, 061 | 185, 706 | 1, 284 | 214, 565 | 1, 484 | 202, 999 |
| New Zealand..... | 3 | 85, 561 | 1 | 2154, 196 | 1 | 183, 693 | 7 | 167, 193 | 1 | 175, 534 |
| Canada..... | 1, 064 | 167, 280 | 10, 274 | 180, 743 | 1, 219 | 134, 657 | 1, 721 | 110, 533 | 1, 779 | 114, 162 |
| Italy..... | 13, 308 | 60, 560 | 3, 868 | 86, 228 | 7, 920 | 72, 947 | 13, 123 | 70, 078 | 10, 210 | 80, 454 |
| Switzerland..... | 7, 150 | 70, 075 | 3, 765 | 51, 726 | 3, 456 | 61, 972 | 3, 638 | 75, 058 | 3, 396 | 62, 695 |
| Denmark..... | 1, 414 | 527 | 819 | 18, 783 | 1, 427 | 15, 345 | 1, 102 | 11, 644 | 869 | 13, 417 |
| Australia..... | 360 | 799 | 1, 550 | 9, 606 | 1, 859 | 14, 803 | 12, 097 | 12, 338 | ----- | ----- |
| Argentina..... | 10, 447 | 16 | 3, 402 | 657 | 3, 431 | 866 | 3, 228 | 1, 224 | ----- | 763 |
| Yugoslavia..... | 0 | 0 | 164 | 4, 861 | 342 | 4, 180 | 389 | 5, 826 | 325 | 4, 132 |
| Finland..... | 478 | 2, 086 | 33 | 8, 421 | 62 | 6, 364 | 34 | 6, 502 | ----- | 3, 634 |
| Czechoslovakia..... | 0 | 0 | 1, 777 | 8, 048 | 1, 964 | 7, 732 | 2, 534 | 8, 463 | 2, 626 | 7, 923 |
| Hungary..... | ----- | ----- | 1, 923 | 1, 769 | 1, 626 | 1, 834 | 1, 733 | 2, 609 | 1, 784 | 1, 398 |
| Bulgaria..... | 52 | 5, 972 | 0 | 199 | 42 | 187 | 19 | 5, 790 | ----- | 1, 931 |
| Russia..... | 3, 911 | 7, 011 | 1, 289 | 114 | 1, 130 | 172 | 1, 133 | 1, 847 | ----- | ----- |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 257, 407 | 950 | 331, 500 | 1, 950 | 333, 187 | 2, 094 | 325, 891 | 5, 363 | 333, 307 | 5, 852 |
| Germany..... | 48, 687 | 1, 967 | 162, 940 | 2, 491 | 141, 345 | 2, 320 | 158, 740 | 3, 160 | 135, 530 | 3, 664 |
| United States..... | 46, 346 | 5, 142 | 62, 403 | 9, 190 | 78, 417 | 3, 903 | 79, 796 | 3, 410 | 81, 403 | 2, 600 |
| France..... | 49, 056 | 26, 880 | 34, 064 | 29, 978 | 34, 673 | 31, 481 | 36, 856 | 25, 568 | 43, 907 | 41, 797 |
| Belgium..... | 31, 771 | 354 | 38, 275 | 1, 817 | 33, 187 | 1, 239 | 36, 538 | 1, 001 | 39, 025 | 904 |
| Austria..... | 12, 298 | 996 | 7, 970 | 681 | 7, 665 | 1, 376 | 7, 553 | 1, 387 | 6, 401 | 2, 461 |
| Algeria..... | 6, 592 | 138 | 7, 897 | 278 | 5, 464 | 234 | 6, 849 | 210 | 8, 821 | 186 |
| Egypt..... | 8, 182 | 48 | 7, 157 | 155 | 6, 842 | 79 | 6, 740 | 176 | 7, 085 | 155 |
| Spain..... | 5, 032 | 53 | 5, 307 | 133 | 7, 023 | 79 | 7, 576 | 1, 447 | ----- | ----- |
| Cuba..... | 4, 520 | 7 | 5, 499 | 3 | 4, 463 | 2 | 5, 210 | 3 | ----- | ----- |
| Irish Free State..... | 0 | 0 | 2, 823 | 483 | 2, 740 | 403 | 2, 414 | 212 | 2, 449 | 133 |
| Sweden..... | 946 | 41 | 1, 214 | 730 | 1, 375 | 656 | 1, 522 | 574 | 0 | 1, 501 |
| Dutch East Indies..... | 757 | 0 | 1, 362 | 0 | 1, 763 | 0 | 1, 997 | 0 | 1, 514 | 0 |
| Norway..... | 603 | 377 | 1, 301 | 702 | 1, 268 | 757 | 1, 452 | 894 | 1, 090 | 927 |
| British India..... | 1, 314 | 0 | 1, 157 | 6 | 1, 190 | 5 | 1, 332 | 4 | 1, 218 | 6 |
| Tunis..... | 1, 382 | 19 | 1, 185 | 10 | 1, 125 | 22 | 1, 314 | 14 | 1, 430 | 47 |
| Brazil..... | 4, 178 | 1 | 1, 101 | 0 | 1, 545 | 0 | 1, 395 | 0 | ----- | ----- |
| Union of South Africa..... | 4, 991 | 3 | 256 | 190 | 344 | 114 | 483 | 239 | 639 | 83 |
| Total 32 countries..... | 522, 821 | 534, 182 | 701, 440 | 719, 762 | 688, 174 | 706, 022 | 714, 700 | 720, 359 | 687, 794 | 727, 991 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. All cheese made from milk, including "cottage cheese."

¹ International Yearbook of Agricultural Statistics.

² 4-year average.

³ 3-year average.

⁴ Average for Austria-Hungary.

⁵ 1 year only.

⁶ Java and Madura only.

TABLE 469.—*Cheese, No. 1 American fresh flats: Average wholesale price per pound, New York, 1924–1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1924..... | 22 | 22 | 21 | 17 | 17 | 20 | 21 | 21 | 22 | 20 | 21 | 23 | 21 |
| 1925..... | 24 | 24 | 24 | 23 | 21 | 23 | 24 | 25 | 25 | 26 | 27 | 27 | 24 |
| 1926..... | ----- | 24 | 23 | 21 | 20 | 22 | 23 | 23 | 24 | 25 | ----- | ----- | ----- |
| 1927..... | ----- | ----- | 23 | ----- | 23 | 24 | 25 | 26 | 27 | 28 | ----- | ----- | ----- |
| 1928..... | 27 | 24 | 23 | 22 | 23 | 25 | 26 | 26 | 27 | ----- | 26 | 26 | ----- |
| 1929..... | 25 | 24 | 24 | 23 | 22 | 24 | 24 | 23 | 24 | 25 | 24 | 22 | 24 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the market.

TABLE 470.—*Oleomargarine: Production and consumption in the United States, 1924-1928*

| Year beginning July | Production | | | Stocks beginning of year | Exports | Stocks end of year | Consumption | |
|---------------------|------------|------------|------------|--------------------------|------------|--------------------|-------------|------------|
| | Colored | Uncolored | Total | | | | Total | Per capita |
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | Lbs. |
| 1924..... | 11, 280 | 204, 123 | 215, 403 | 2, 607 | 887 | 2, 720 | 214, 403 | 1. 87 |
| 1925..... | 13, 181 | 234, 866 | 248, 047 | 2, 720 | 1, 256 | 2, 942 | 240, 569 | 2. 12 |
| 1926..... | 14, 502 | 242, 655 | 257, 157 | 2, 942 | 942 | 3, 209 | 255, 858 | 2. 17 |
| 1927..... | 15, 351 | 279, 348 | 294, 699 | 3, 299 | 732 | 3, 187 | 294, 079 | 2. 46 |
| 1928..... | 16, 306 | 316, 816 | 333, 122 | 3, 187 | 633 | 4, 191 | 331, 485 | 2. 74 |

Bureau of Agricultural Economics. Production and stocks from reports of the Bureau of Internal Revenue. Exports from reports of the Bureau of Foreign and Domestic Commerce. See 1927 Yearbook, p. 1088, for data for earlier years.

TABLE 471.—*Oleomargarine: Materials used in manufacture, 1917-1928*

| Material | Year beginning July— | | | | | | | | | | | |
|-----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Oleo oil..... | 96, 378 | 97, 464 | 89, 842 | 49, 676 | 40, 980 | 46, 645 | 52, 265 | 44, 102 | 47, 418 | 48, 741 | 45, 477 | 47, 185 |
| Coconut oil..... | 61, 773 | 69, 640 | 80, 784 | 103, 112 | 57, 394 | 65, 656 | 85, 059 | 79, 449 | 98, 307 | 107, 654 | 141, 000 | 171, 412 |
| Cottonseed oil..... | 36, 454 | 37, 846 | 39, 450 | 18, 533 | 15, 420 | 18, 757 | 20, 640 | 20, 966 | 25, 608 | 23, 372 | 24, 801 | 28, 173 |
| Milk..... | 61, 128 | 68, 000 | 76, 000 | 79, 716 | 53, 939 | 59, 835 | 69, 090 | 61, 924 | 72, 662 | 73, 700 | 83, 115 | 94, 752 |
| Peanut oil..... | 21, 593 | 38, 764 | 48, 346 | 16, 332 | 11, 625 | 6, 922 | 5, 656 | 4, 392 | 5, 257 | 4, 872 | 5, 459 | 6, 817 |
| Salt..... | 18, 279 | 21, 432 | 24, 864 | 25, 365 | 16, 262 | 17, 998 | 20, 593 | 18, 725 | 20, 593 | 21, 683 | 25, 024 | 27, 311 |
| Oleo stearine..... | 3, 427 | 2, 456 | 2, 132 | 4, 858 | 4, 574 | 4, 815 | 5, 317 | 5, 250 | 5, 314 | 5, 145 | 5, 532 | 5, 834 |
| Neutral lard..... | 45, 702 | 45, 764 | 38, 456 | 29, 268 | 27, 057 | 29, 568 | 32, 210 | 25, 674 | 25, 172 | 24, 872 | 25, 036 | 24, 189 |
| Oleo stock..... | 7, 526 | 6, 342 | 5, 804 | 2, 065 | 2, 143 | 2, 322 | 2, 756 | 3, 183 | 3, 082 | 2, 552 | 1, 738 | 1, 294 |
| Butter..... | 4, 548 | 5, 680 | 6, 845 | 1, 499 | 1, 107 | 1, 576 | 1, 900 | 1, 509 | 2, 330 | 2, 070 | 2, 484 | 2, 611 |
| Corn oil..... | 60 | 40 | 35 | 926 | | | 457 | 196 | 174 | 183 | 38 | |
| Soybean oil..... | | | | 461 | | | | | 1 | 33 | | |
| Edible tallow..... | | | | 233 | | | 24 | 111 | 93 | 219 | 70 | 26 |
| Mustard-seed oil..... | | | | | 110 | | | 38 | 27 | 34 | 53 | 56 |
| Coloring..... | | | | 26 | 76 | | 11 | 26 | 38 | 41 | 18 | 19 |
| Miscellaneous..... | 14 | 11 | 14 | 9, 776 | 3, 417 | 2, 918 | 432 | 688 | 1, 374 | 918 | 1, 220 | 1, 474 |
| Total..... | 356, 882 | 393, 439 | 412, 572 | 341, 956 | 233, 929 | 257, 023 | 294, 463 | 266, 234 | 307, 460 | 316, 085 | 361, 069 | 410, 937 |

Bureau of Agricultural Economics. 1917-1919, Institute of Margarin Manufacturers; 1920-1928, annual reports of the Bureau of Internal Revenue.

TABLE 472.—*Oleomargarine, standard, uncolored: Monthly average wholesale price per pound, Chicago, 1914-1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| Average: | | | | | | | | | | | | | |
| 1914-1920..... | 24. 6 | 24. 4 | 24. 1 | 24. 4 | 25. 0 | 25. 0 | 24. 9 | 24. 9 | 25. 3 | 25. 4 | 26. 1 | 26. 1 | 25. 0 |
| 1921-1925..... | 22. 3 | 21. 7 | 21. 3 | 20. 7 | 20. 4 | 20. 1 | 20. 5 | 21. 3 | 21. 4 | 21. 6 | 22. 0 | 22. 3 | 21. 3 |
| 1914..... | 18. 0 | 18. 0 | 18. 0 | 17. 0 | 17. 0 | 17. 0 | 17. 0 | 17. 0 | 18. 0 | 18. 0 | 18. 0 | 18. 0 | 17. 6 |
| 1915..... | 18. 0 | 18. 0 | 18. 0 | 18. 0 | 17. 0 | 17. 0 | 17. 0 | 17. 0 | 17. 0 | 17. 0 | 17. 0 | 17. 0 | 17. 3 |
| 1916..... | 17. 0 | 17. 0 | 17. 0 | 18. 0 | 19. 0 | 19. 0 | 19. 0 | 19. 0 | 19. 0 | 20. 0 | 22. 0 | 24. 0 | 19. 2 |
| 1917..... | 22. 5 | 22. 5 | 22. 5 | 24. 5 | 25. 5 | 25. 5 | 25. 5 | 25. 5 | 26. 5 | 28. 5 | 28. 5 | 28. 5 | 25. 5 |
| 1918..... | 28. 5 | 28. 5 | 28. 5 | 28. 5 | 28. 5 | 28. 5 | 28. 5 | 29. 5 | 29. 5 | 30. 5 | 32. 5 | 32. 5 | 29. 5 |
| 1919..... | 32. 5 | 32. 5 | 31. 5 | 31. 5 | 34. 5 | 35. 5 | 35. 5 | 35. 5 | 36. 5 | 34. 5 | 35. 5 | 35. 5 | 34. 3 |
| 1920..... | 35. 5 | 34. 4 | 33. 5 | 33. 5 | 33. 5 | 32. 6 | 31. 7 | 30. 5 | 30. 5 | 29. 5 | 29. 5 | 27. 0 | 31. 8 |
| 1921..... | 24. 9 | 23. 6 | 22. 2 | 20. 5 | 19. 8 | 18. 5 | 18. 5 | 20. 5 | 20. 5 | 20. 5 | 21. 0 | 19. 5 | 20. 8 |
| 1922..... | 19. 0 | 17. 5 | 17. 5 | 17. 5 | 17. 5 | 17. 5 | 18. 2 | 18. 5 | 18. 5 | 18. 5 | 19. 2 | 20. 5 | 18. 3 |
| 1923..... | 20. 5 | 20. 5 | 20. 5 | 20. 5 | 20. 5 | 20. 5 | 20. 5 | 20. 5 | 21. 0 | 21. 5 | 22. 2 | 23. 5 | 20. 9 |
| 1924..... | 22. 5 | 22. 5 | 21. 9 | 20. 5 | 20. 5 | 20. 5 | 21. 2 | 22. 5 | 22. 5 | 23. 0 | 24. 0 | 24. 5 | 22. 2 |
| 1925..... | 24. 5 | 24. 5 | 24. 5 | 24. 5 | 21. 9 | 23. 5 | 23. 7 | 24. 5 | 24. 5 | 24. 5 | 24. 5 | 24. 5 | 24. 3 |
| 1926..... | 24. 5 | 24. 3 | 23. 5 | 23. 3 | 22. 5 | 22. 5 | 22. 5 | 22. 5 | 22. 5 | 22. 5 | 21. 8 | 21. 5 | 22. 8 |
| 1927..... | 21. 5 | 21. 5 | 21. 5 | 21. 5 | 21. 5 | 21. 5 | 21. 5 | 21. 5 | 23. 9 | 24. 5 | 23. 5 | 23. 5 | 22. 3 |
| 1928..... | 23. 5 | 23. 5 | 23. 5 | 21. 5 | 21. 5 | 21. 5 | 21. 5 | 21. 5 | 22. 0 | 23. 5 | 23. 5 | 23. 5 | 22. 5 |
| 1929..... | 23. 5 | 23. 5 | 23. 5 | 23. 5 | 23. 5 | 23. 5 | 23. 5 | 23. 5 | 23. 5 | 23. 5 | 23. 5 | 23. 5 | 23. 5 |

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics Wholesale Price Bulletins.

TABLE 473.—*Poultry, live: Freight receipts, by States, at New York, 1927, 1928, 1929, and monthly, 1929*

| State | 1927 | 1928 | 1929 | | | | | | | | | | | | |
|---------------|--------|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | | Total | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
| | | | Car-loads | Car-loads | Car-loads | Car-loads | Car-loads | Car-loads | Car-loads | Car-loads | Car-loads | Car-loads | Car-loads | Car-loads | Car-loads |
| Ala. | 82 | 176 | 181 | 11 | 22 | 24 | 37 | 23 | 16 | 10 | 12 | 2 | 1 | 15 | 8 |
| Ark. | 423 | 410 | 369 | 43 | 40 | 40 | 52 | 45 | 34 | 38 | 35 | 10 | 7 | 10 | 15 |
| Colo. | 52 | 89 | 86 | 7 | 9 | 5 | 2 | 5 | 4 | 7 | 11 | 5 | 9 | 12 | 10 |
| Fla. | 45 | 151 | 179 | 12 | 29 | 28 | 60 | 27 | 14 | 3 | 3 | | | 2 | 1 |
| Ga. | | | 2 | | | 1 | 1 | | | | | | | | |
| Ill. | 1,227 | 874 | 880 | 53 | 36 | 28 | 36 | 40 | 46 | 61 | 76 | 105 | 140 | 119 | 140 |
| Ind. | 1,267 | 842 | 983 | 49 | 29 | 19 | 39 | 42 | 51 | 72 | 84 | 107 | 164 | 156 | 151 |
| Iowa | 856 | 586 | 354 | 24 | 4 | 2 | 1 | | 19 | 44 | 45 | 46 | 64 | 44 | 61 |
| Kans. | 661 | 474 | 422 | 59 | 28 | 27 | 27 | 30 | 32 | 22 | 37 | 45 | 45 | 28 | 42 |
| Ky. | 739 | 741 | 397 | 31 | 32 | 46 | 67 | 41 | 23 | 17 | 22 | 23 | 27 | 31 | 37 |
| La. | | 1 | | | | | | | | | | | | | |
| Mass. | | 6 | | | | | | | | | | | | | |
| Mich. | | 1 | 6 | | | | | | | 1 | 1 | 4 | | | |
| Minn. | 223 | 164 | 131 | 6 | | | | | 4 | 9 | 14 | 20 | 36 | 25 | 16 |
| Miss. | 154 | 188 | 90 | 7 | 28 | 21 | 15 | 9 | 1 | 1 | 1 | | | 6 | 1 |
| Mo. | 2,147 | 1,896 | 1,874 | 127 | 78 | 82 | 122 | 120 | 112 | 173 | 235 | 211 | 216 | 182 | 216 |
| Nebr. | 990 | 1,078 | 1,150 | 101 | 55 | 40 | 36 | 60 | 87 | 89 | 112 | 136 | 168 | 125 | 147 |
| N. Mex. | 1 | 4 | 13 | 2 | 3 | 5 | 3 | | | | | | | | |
| N. Y. | | 1 | 1 | | | | | | | | 1 | | | | |
| N. C. | 91 | 158 | 240 | 30 | 34 | 60 | 52 | 19 | 11 | 11 | 10 | 6 | 4 | 1 | 2 |
| N. Dak. | | 33 | 57 | | | | | | | | 3 | 7 | 24 | 21 | 2 |
| Ohio | 429 | 343 | 335 | 9 | 2 | | 1 | | 16 | 18 | 16 | 44 | 77 | 80 | 72 |
| Okla. | 751 | 873 | 835 | 112 | 100 | 103 | 99 | 72 | 61 | 49 | 75 | 51 | 40 | 37 | 36 |
| Pa. | 58 | 36 | 44 | 3 | 5 | 9 | | 2 | 1 | 3 | 2 | 1 | 2 | 9 | 7 |
| S. C. | 29 | 41 | 125 | 11 | 17 | 28 | 28 | 19 | 8 | 5 | 4 | 1 | 1 | | 3 |
| S. Dak. | 187 | 313 | 273 | 19 | 8 | 6 | 5 | 9 | 10 | 24 | 19 | 32 | 45 | 48 | 48 |
| Tenn. | 975 | 1,000 | 884 | 77 | 101 | 125 | 203 | 114 | 50 | 51 | 46 | 22 | 19 | 34 | 42 |
| Tex. | 365 | 436 | 348 | 55 | 67 | 58 | 51 | 42 | 29 | 12 | 6 | 2 | 1 | 16 | 9 |
| Utah. | | | 4 | | | | | 1 | 3 | | | | | | |
| Va. | 56 | 68 | 56 | 2 | 4 | 3 | 16 | 6 | 2 | 3 | 3 | 1 | | 9 | 7 |
| Wis. | 253 | 219 | 175 | 2 | 1 | | | 3 | 15 | 31 | 20 | 30 | 35 | 27 | 11 |
| Wyo. | 2 | 5 | 13 | 2 | 1 | | 1 | | 1 | | | 1 | 1 | 3 | 3 |
| Other States. | 38 | | | | 1 | | | | | | | | | | |
| Total. | 12,104 | 11,267 | 10,493 | 854 | 733 | 760 | 955 | 729 | 650 | 754 | 893 | 912 | 1,126 | 1,040 | 1,087 |

TABLE 474.—*Poultry, live: Freight receipts, make-up of cars unloaded, by classes, at New York, 1927-1929*

| Class | 1927 | 1928 | 1929 | | | | | | | | | | | | |
|--------------------|------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | | | Total | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
| | | | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent |
| Fowls..... | 66.2 | 68.9 | 65.5 | 76.7 | 88.4 | 91.0 | 91.4 | 87.5 | 79.0 | 59.9 | 49.5 | 47.0 | 46.3 | 43.1 | 52.6 |
| Broilers..... | 5.9 | 4.9 | 5.1 | 4 | 5.4 | 4 | 2.7 | 7.4 | 15.4 | 25.7 | 14.5 | 1.6 | 1 | 1 | 2 |
| Chickens..... | 22.4 | 20.0 | 22.6 | 17.1 | 7.1 | 4.3 | 1.1 | 2 | 1.0 | 10.9 | 32.8 | 48.3 | 49.9 | 38.4 | 31.6 |
| Cocks..... | 2.3 | 2.3 | 1.9 | 1.9 | 2.1 | 2.4 | 2.6 | 3.6 | 2.1 | 2.8 | 2.1 | 1.7 | 1.1 | 1 | 1 |
| Capons..... | 3 | 3 | 2 | 9 | 7 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Ducks..... | 1.7 | 1.3 | 1.6 | 1.0 | 4 | 5 | 4 | 4 | 6 | 1 | 0 | 1.3 | 2.2 | 3.8 | 5.1 |
| Geese..... | 1.0 | 1.0 | 1.1 | 1.2 | 4 | 3 | 1 | 0 | 1 | 0 | 1 | 1 | 3 | 2.9 | 5.6 |
| Turkeys..... | 9 | 1.1 | 1.6 | 5 | 4 | 4 | 3 | 3 | 2 | 0 | 0 | 0 | 1 | 10.8 | 3.6 |
| Miscellaneous..... | 2 | 2 | 4 | 3 | 1 | 4 | 1.4 | 6 | 1.6 | 1 | 0 | 0 | 0 | 0 | 1 |

Bureau of Agricultural Economics.

TABLE 475.—*Poultry, dressed: Receipts, gross weight, at four markets, 1920-1929*

BOSTON

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-----------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| 1920..... | 3,934 | 1,749 | 1,597 | 1,037 | 1,464 | 2,221 | 1,858 | 1,696 | 2,096 | 2,628 | 5,911 | 7,895 | 34,086 |
| 1921..... | 3,377 | 2,229 | 1,465 | 1,707 | 1,795 | 2,086 | 1,499 | 2,437 | 2,482 | 3,581 | 7,472 | 9,791 | 39,921 |
| 1922..... | 4,175 | 2,765 | 2,478 | 1,705 | 2,551 | 2,883 | 2,091 | 2,198 | 2,479 | 3,306 | 7,488 | 10,444 | 44,563 |
| 1923..... | 7,690 | 3,785 | 2,917 | 1,946 | 2,439 | 2,778 | 2,427 | 2,661 | 2,674 | 4,418 | 10,752 | 11,526 | 56,013 |
| 1924..... | 6,210 | 4,607 | 3,072 | 2,235 | 2,602 | 2,952 | 3,402 | 2,856 | 3,270 | 4,402 | 11,842 | 13,724 | 61,264 |
| 1925..... | 4,200 | 3,252 | 2,697 | 2,181 | 2,582 | 2,893 | 2,833 | 2,788 | 2,554 | 4,336 | 7,907 | 8,439 | 46,720 |
| 1926..... | 3,778 | 2,981 | 2,837 | 2,052 | 2,598 | 3,196 | 3,161 | 3,677 | 3,960 | 4,089 | 8,891 | 11,042 | 58,162 |
| 1927..... | 4,318 | 3,610 | 2,440 | 2,398 | 3,653 | 3,455 | 2,906 | 3,012 | 3,404 | 4,663 | 8,511 | 10,245 | 53,305 |
| 1928..... | 4,591 | 3,756 | 4,137 | 2,877 | 3,285 | 3,290 | 3,899 | 3,468 | 3,355 | 4,680 | 7,716 | 10,329 | 55,583 |
| 1929..... | 4,586 | 3,231 | 2,315 | 2,855 | 2,718 | 3,369 | 3,153 | 3,628 | 4,309 | 5,048 | 8,826 | 10,395 | 54,433 |

NEW YORK

| | | | | | | | | | | | | | |
|-----------|--------|--------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| 1920..... | 11,217 | 7,557 | 3,928 | 1,367 | 5,480 | 5,292 | 6,129 | 4,428 | 6,273 | 8,053 | 17,651 | 23,718 | 101,093 |
| 1921..... | 11,441 | 7,006 | 5,190 | 5,021 | 4,883 | 6,150 | 5,314 | 8,092 | 10,277 | 11,887 | 21,182 | 27,208 | 124,551 |
| 1922..... | 10,783 | 6,909 | 6,371 | 6,399 | 7,896 | 8,822 | 6,785 | 7,768 | 9,115 | 12,594 | 22,232 | 32,538 | 138,212 |
| 1923..... | 21,730 | 12,335 | 8,390 | 6,916 | 6,804 | 8,589 | 9,414 | 9,497 | 9,653 | 16,509 | 26,822 | 27,289 | 163,948 |
| 1924..... | 15,603 | 11,927 | 9,893 | 7,368 | 10,172 | 10,157 | 10,502 | 10,504 | 12,981 | 15,916 | 28,875 | 35,464 | 179,362 |
| 1925..... | 14,400 | 10,871 | 7,949 | 8,119 | 10,245 | 10,717 | 11,668 | 11,110 | 12,409 | 16,696 | 28,857 | 27,216 | 170,285 |
| 1926..... | 13,078 | 10,646 | 9,921 | 8,248 | 10,594 | 14,041 | 13,555 | 14,009 | 15,068 | 18,129 | 31,924 | 33,082 | 192,897 |
| 1927..... | 12,954 | 8,957 | 8,722 | 7,770 | 11,633 | 13,635 | 12,168 | 14,589 | 16,470 | 17,682 | 31,740 | 32,797 | 188,117 |
| 1928..... | 14,999 | 11,064 | 9,322 | 9,703 | 10,628 | 11,127 | 13,252 | 13,850 | 14,332 | 21,799 | 31,846 | 32,464 | 194,376 |
| 1929..... | 14,221 | 10,900 | 9,964 | 9,520 | 10,233 | 11,876 | 13,078 | 15,707 | 16,558 | 20,602 | 31,495 | 32,903 | 197,057 |

PHILADELPHIA

| | | | | | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 1920..... | 1,553 | 1,881 | 1,906 | 918 | 1,466 | 1,286 | 1,019 | 1,215 | 1,044 | 1,588 | 2,348 | 5,382 | 21,606 |
| 1921..... | 1,496 | 1,071 | 1,411 | 1,005 | 1,303 | 1,565 | 1,226 | 1,419 | 1,587 | 2,020 | 2,882 | 5,905 | 22,892 |
| 1922..... | 1,947 | 1,790 | 1,077 | 664 | 1,182 | 1,304 | 1,237 | 1,217 | 1,237 | 1,356 | 2,653 | 5,655 | 21,819 |
| 1923..... | 2,206 | 1,630 | 1,388 | 1,042 | 1,055 | 1,509 | 1,343 | 1,618 | 1,348 | 1,749 | 3,281 | 6,542 | 24,611 |
| 1924..... | 2,614 | 1,818 | 1,704 | 1,194 | 1,234 | 1,458 | 1,536 | 1,660 | 1,421 | 1,873 | 4,063 | 7,075 | 27,640 |
| 1925..... | 2,818 | 2,030 | 2,183 | 1,450 | 1,343 | 1,638 | 1,739 | 1,810 | 1,552 | 1,924 | 4,702 | 6,106 | 29,295 |
| 1926..... | 2,906 | 1,791 | 2,203 | 1,717 | 1,374 | 1,758 | 1,853 | 2,039 | 2,352 | 2,123 | 4,916 | 7,094 | 32,126 |
| 1927..... | 2,885 | 2,006 | 2,005 | 1,769 | 1,695 | 1,668 | 1,398 | 1,918 | 2,530 | 2,613 | 4,432 | 6,903 | 31,822 |
| 1928..... | 2,373 | 1,601 | 1,885 | 1,359 | 1,558 | 2,177 | 1,931 | 1,763 | 2,097 | 2,965 | 4,925 | 7,210 | 31,844 |
| 1929..... | 2,548 | 1,851 | 1,680 | 1,471 | 1,557 | 1,663 | 2,134 | 2,319 | 2,302 | 2,542 | 6,002 | 8,595 | 34,664 |

CHICAGO

| | | | | | | | | | | | | | |
|-----------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1920..... | 6,646 | 2,687 | 980 | 816 | 1,512 | 2,369 | 2,379 | 2,659 | 3,370 | 4,001 | 10,752 | 19,153 | 57,324 |
| 1921..... | 6,343 | 3,328 | 2,794 | 2,104 | 2,421 | 2,524 | 2,097 | 2,615 | 3,804 | 4,157 | 15,723 | 17,082 | 64,992 |
| 1922..... | 5,345 | 3,042 | 3,394 | 2,744 | 2,744 | 3,597 | 3,590 | 4,250 | 4,290 | 4,178 | 13,167 | 23,320 | 73,661 |
| 1923..... | 11,497 | 5,208 | 4,057 | 2,532 | 2,912 | 3,329 | 3,679 | 4,018 | 4,724 | 5,411 | 15,163 | 27,743 | 90,273 |
| 1924..... | 12,723 | 8,043 | 5,675 | 4,385 | 3,311 | 3,295 | 4,042 | 2,823 | 2,196 | 4,791 | 15,675 | 21,805 | 88,464 |
| 1925..... | 6,167 | 3,230 | 2,219 | 1,573 | 1,996 | 2,239 | 1,376 | 1,760 | 2,168 | 4,303 | 20,022 | 25,033 | 72,086 |
| 1926..... | 6,360 | 3,159 | 2,383 | 1,792 | 1,805 | 2,105 | 2,154 | 2,607 | 2,897 | 6,397 | 22,863 | 23,110 | 77,632 |
| 1927..... | 6,495 | 3,546 | 2,195 | 1,835 | 2,872 | 2,257 | 1,227 | 2,257 | 2,531 | 3,752 | 15,739 | 19,029 | 63,735 |
| 1928..... | 6,639 | 3,591 | 2,216 | 1,876 | 2,137 | 1,977 | 2,771 | 2,829 | 3,580 | 5,719 | 15,301 | 18,544 | 67,180 |
| 1929..... | 7,712 | 3,469 | 2,707 | 2,725 | 2,811 | 3,270 | 3,520 | 3,984 | 4,710 | 9,070 | 25,578 | 23,812 | 93,368 |

TOTAL

| | | | | | | | | | | | | | |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| 1920..... | 23,350 | 13,874 | 8,411 | 4,138 | 9,922 | 11,168 | 11,385 | 9,998 | 12,783 | 16,270 | 36,662 | 56,148 | 214,109 |
| 1921..... | 22,659 | 13,634 | 10,860 | 9,837 | 10,402 | 12,325 | 10,136 | 15,463 | 18,150 | 21,645 | 47,269 | 59,986 | 252,356 |
| 1922..... | 22,250 | 14,506 | 13,320 | 11,512 | 14,373 | 16,606 | 13,703 | 15,433 | 17,121 | 21,434 | 45,540 | 71,957 | 277,755 |
| 1923..... | 43,123 | 22,858 | 16,752 | 12,436 | 13,210 | 16,205 | 16,863 | 17,794 | 18,399 | 26,087 | 56,018 | 73,100 | 334,845 |
| 1924..... | 37,150 | 26,395 | 20,344 | 15,182 | 17,319 | 17,862 | 19,572 | 17,543 | 19,868 | 26,982 | 60,445 | 78,068 | 356,730 |
| 1925..... | 27,585 | 19,383 | 15,048 | 13,323 | 16,166 | 17,487 | 17,676 | 17,466 | 18,683 | 27,259 | 61,488 | 66,794 | 318,358 |
| 1926..... | 26,122 | 18,676 | 17,344 | 13,809 | 16,371 | 21,099 | 20,724 | 22,932 | 24,278 | 30,738 | 68,594 | 75,228 | 355,815 |
| 1927..... | 26,652 | 18,119 | 15,362 | 13,772 | 19,853 | 21,015 | 17,789 | 22,376 | 23,935 | 28,710 | 60,422 | 68,974 | 336,979 |
| 1928..... | 28,602 | 20,012 | 17,560 | 15,815 | 17,608 | 18,571 | 21,853 | 21,910 | 23,564 | 35,163 | 59,788 | 63,537 | 348,983 |
| 1929..... | 29,067 | 19,451 | 16,666 | 16,571 | 17,319 | 20,178 | 21,885 | 25,638 | 27,879 | 37,262 | 71,901 | 75,705 | 379,522 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

TABLE 476.—*Poultry, dressed: Receipts, gross weight, at four markets, by State of origin, 1922-1929*

BOSTON

| State | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Illinois..... | 19,618 | 23,308 | 20,155 | 12,292 | 14,768 | 14,203 | 11,719 | 10,651 |
| Indiana..... | 5,939 | 6,558 | 7,382 | 6,524 | 4,884 | 5,225 | 5,368 | 3,200 |
| Iowa..... | 4,422 | 7,131 | 6,834 | 6,957 | 8,141 | 7,003 | 6,648 | 7,609 |
| Ohio..... | 1,708 | 1,141 | 1,216 | 255 | 300 | 533 | 390 | 140 |
| Kansas..... | 1,454 | 2,114 | 2,864 | 3,566 | 4,027 | 3,592 | 4,557 | 4,917 |
| New York..... | 1,454 | 1,850 | 1,111 | 1,045 | 1,251 | 1,467 | 1,709 | 757 |
| Oklahoma..... | 1,253 | 1,043 | 1,737 | 1,699 | 1,571 | 2,066 | 2,662 | 1,364 |
| Minnesota..... | 1,076 | 2,222 | 3,878 | 3,929 | 5,076 | 5,886 | 6,860 | 6,786 |
| Michigan..... | 1,015 | 527 | 911 | 622 | 524 | 681 | 888 | 663 |
| Kentucky..... | 1,005 | 1,330 | 854 | 822 | 970 | 453 | 204 | 141 |
| Missouri..... | 774 | 1,086 | 2,540 | 1,822 | 1,944 | 1,509 | 1,881 | 2,722 |
| Wisconsin..... | 680 | 291 | 612 | 375 | 1,236 | 553 | 932 | 936 |
| Maine..... | 647 | 791 | 706 | 709 | 438 | 690 | 509 | 500 |
| Nebraska..... | 471 | 682 | 1,336 | 1,707 | 2,297 | 1,930 | 3,298 | 3,163 |
| Massachusetts..... | 413 | 357 | 344 | 205 | 260 | 495 | 85 | 27 |
| Vermont..... | 200 | 149 | 105 | 74 | 34 | 26 | 28 | 31 |
| Tennessee..... | 65 | 39 | 73 | 118 | 234 | 160 | 330 | 510 |
| New Hampshire..... | 53 | 47 | 50 | 41 | 29 | 62 | 17 | 15 |
| Pennsylvania..... | 49 | 72 | 114 | 180 | 47 | 260 | 104 | 1 |
| Maryland..... | 39 | 59 | 92 | 11 | 24 | 2 | | |
| North Dakota..... | 14 | 294 | 314 | 237 | 553 | 469 | 478 | 1,473 |
| South Dakota..... | 3 | 121 | 101 | 92 | 131 | 46 | 114 | 559 |
| Texas..... | (1) | (1) | 6,185 | 2,797 | 3,703 | 5,110 | 5,034 | 6,693 |
| Other States..... | 2,189 | 4,681 | 1,750 | 467 | 555 | 812 | 1,761 | 2,245 |
| Canada..... | 22 | 120 | | 174 | 165 | 72 | 7 | |
| Total..... | 44,563 | 56,013 | 61,264 | 46,720 | 53,162 | 53,305 | 55,583 | 54,433 |

NEW YORK

| State | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Illinois..... | 40,911 | 48,267 | 57,246 | 45,861 | 32,890 | 28,356 | 24,864 | 25,393 |
| Indiana..... | 17,021 | 15,814 | 14,886 | 15,215 | 12,918 | 11,585 | 11,624 | 11,480 |
| Iowa..... | 15,854 | 19,520 | 18,775 | 18,776 | 20,840 | 25,226 | 26,324 | 30,819 |
| Missouri..... | 10,522 | 14,630 | 18,629 | 17,148 | 19,146 | 19,231 | 19,817 | 19,305 |
| Kansas..... | 10,174 | 15,151 | 8,429 | 11,379 | 20,757 | 20,725 | 21,070 | 20,448 |
| Texas..... | 5,296 | 7,206 | 12,108 | 6,665 | 1,050 | 13,192 | 16,181 | 18,386 |
| Ohio..... | 5,113 | 4,131 | 4,337 | 4,352 | 3,298 | 3,920 | 2,306 | 3,399 |
| Minnesota..... | 4,412 | 6,382 | 9,143 | 9,372 | 11,840 | 10,820 | 13,937 | 12,914 |
| Tennessee..... | 3,964 | 3,445 | 4,070 | 2,773 | 3,531 | 4,507 | 4,542 | 3,894 |
| Kentucky..... | 3,873 | 5,524 | 5,082 | 4,361 | 4,497 | 4,700 | 5,234 | 3,050 |
| New York..... | 3,572 | 3,062 | 3,119 | 11,459 | 12,066 | 16,438 | 14,167 | 12,489 |
| Nebraska..... | 2,515 | 3,036 | 4,610 | 4,288 | 6,979 | 7,041 | 9,057 | 8,120 |
| Oklahoma..... | 2,254 | 2,704 | 2,553 | 3,105 | 6,336 | 7,314 | 5,478 | 7,042 |
| Virginia..... | 1,904 | 1,956 | 2,588 | 1,899 | 2,299 | 2,229 | 2,158 | 2,013 |
| Michigan..... | 1,901 | 1,683 | 1,399 | 702 | 952 | 659 | 2,561 | 1,962 |
| Wisconsin..... | 1,503 | 2,364 | 2,862 | 3,058 | 2,787 | 1,843 | 1,551 | 934 |
| New Jersey..... | 1,395 | 1,552 | 1,661 | 1,303 | 1,298 | 1,022 | 649 | 211 |
| Maryland..... | 1,226 | 860 | 959 | 1,021 | 896 | 757 | 346 | 238 |
| Pennsylvania..... | 1,220 | 1,085 | 1,148 | 922 | 911 | 1,332 | 660 | 524 |
| South Dakota..... | 976 | 1,140 | 1,299 | 1,795 | 2,970 | 3,413 | 3,595 | 4,692 |
| Massachusetts..... | 848 | 632 | 1,408 | 1,146 | 461 | 425 | 336 | 347 |
| California..... | 649 | 1,061 | 528 | 459 | 605 | 318 | 1,117 | 1,753 |
| North Dakota..... | 165 | 769 | 515 | 668 | 1,056 | 1,028 | 1,236 | 1,841 |
| Arkansas..... | 129 | 326 | (1) | 760 | 788 | 78 | 40 | 442 |
| Delaware..... | 109 | 64 | 84 | 91 | 65 | 56 | 54 | 31 |
| Colorado..... | (1) | (1) | 530 | 434 | 600 | 315 | 1,180 | 598 |
| Washington..... | (1) | 238 | 173 | 205 | 673 | 248 | 190 | 619 |
| Idaho..... | (1) | (1) | 242 | 176 | 416 | 244 | 1,656 | 1,730 |
| Montana..... | (1) | (1) | 203 | 123 | 120 | 202 | 471 | 315 |
| Other States..... | 503 | 814 | 601 | 462 | 843 | 846 | 1,928 | 2,568 |
| Canada..... | 203 | 532 | 175 | 279 | 98 | 47 | 47 | 20 |
| Total..... | 138,212 | 163,948 | 179,362 | 170,257 | 192,895 | 188,117 | 194,376 | 197,057 |

1 Included in "Other States."

TABLE 476.—*Poultry, dressed: Receipts, gross weight, at four markets, by State of origin, 1922-1929—Continued*

CHICAGO

| State | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|-------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Iowa..... | 19,001 | 18,654 | 21,023 | 21,538 | 21,420 | 14,719 | 13,117 | 18,505 |
| Illinois..... | 18,720 | 17,497 | 13,184 | 4,517 | 5,920 | 3,893 | 2,581 | 3,411 |
| Wisconsin..... | 7,555 | 7,372 | 7,771 | 5,384 | 5,701 | 3,982 | 3,409 | 4,811 |
| Minnesota..... | 7,310 | 10,764 | 11,425 | 10,267 | 12,586 | 10,541 | 7,829 | 13,833 |
| Missouri..... | 3,952 | 6,231 | 5,980 | 4,621 | 3,828 | 4,812 | 6,379 | 6,647 |
| South Dakota..... | 3,348 | 4,509 | 6,396 | 5,954 | 7,388 | 6,069 | 7,371 | 10,366 |
| North Dakota..... | 3,292 | 7,594 | 5,984 | 5,714 | 6,041 | 4,769 | 5,933 | 8,502 |
| Kansas..... | 2,499 | 3,602 | 3,252 | 3,411 | 4,110 | 2,915 | 4,315 | 5,108 |
| Nebraska..... | 1,959 | 1,813 | 1,690 | 2,149 | 2,632 | 3,217 | 4,295 | 4,169 |
| Indiana..... | 1,317 | 818 | 849 | 731 | 411 | 536 | 559 | 778 |
| Kentucky..... | 849 | 937 | 508 | 80 | 107 | 208 | 32 | 124 |
| Oklahoma..... | 801 | 2,217 | 2,164 | 2,476 | 1,998 | 2,250 | 2,712 | 2,830 |
| Texas..... | 709 | 4,507 | 4,077 | 1,802 | 1,378 | 2,577 | 3,302 | 6,930 |
| Tennessee..... | 694 | 810 | 564 | 186 | 371 | 377 | 361 | 483 |
| Michigan..... | 332 | 276 | 186 | 82 | 40 | 66 | 379 | 62 |
| Montana..... | 271 | 1,500 | 2,095 | 1,738 | 1,773 | 1,022 | 1,530 | 2,904 |
| Arkansas..... | 256 | 372 | 315 | 117 | 177 | 238 | 688 | 193 |
| New York..... | 247 | 335 | 339 | 385 | 837 | 715 | 661 | 837 |
| Mississippi..... | 169 | 94 | 49 | 12 | 3 | 6 | 7 | 38 |
| Idaho..... | 69 | 40 | 75 | 131 | 26 | 120 | 171 | 551 |
| Colorado..... | 63 | 80 | 169 | 390 | 222 | 228 | 293 | 378 |
| Wyoming..... | 17 | 39 | 109 | 81 | 98 | 133 | 260 | 373 |
| Other States..... | 173 | 182 | 260 | 179 | 194 | 312 | 941 | 1,535 |
| Canada..... | 28 | 30 | ----- | 141 | 371 | ----- | 55 | ----- |
| Total..... | 73,661 | 90,273 | 88,464 | 72,086 | 77,632 | 63,735 | 67,180 | 93,368 |

PHILADELPHIA

| State | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Illinois..... | 7,165 | 9,497 | 9,456 | 8,728 | 5,505 | 4,232 | 1,940 | 1,531 |
| Virginia..... | 2,241 | 2,588 | 2,448 | 2,331 | 1,745 | 1,458 | 1,097 | 1,166 |
| Indiana..... | 1,907 | 1,762 | 1,231 | 1,750 | 3,659 | 4,135 | 3,263 | 2,917 |
| Pennsylvania..... | 1,372 | 1,260 | 919 | 901 | 805 | 824 | 245 | 190 |
| Minnesota..... | 1,274 | 2,589 | 2,252 | 2,732 | 3,796 | 4,475 | 3,062 | 4,190 |
| Ohio..... | 1,153 | 820 | 1,206 | 741 | 507 | 696 | 491 | 397 |
| Missouri..... | 1,088 | 522 | 1,002 | 2,315 | 2,035 | 1,168 | 1,249 | 951 |
| Iowa..... | 1,017 | 1,124 | 1,883 | 2,700 | 3,536 | 4,179 | 4,962 | 5,558 |
| West Virginia..... | 985 | 957 | 982 | 1,034 | 797 | 410 | 291 | 313 |
| Kansas..... | 660 | 655 | 932 | 910 | 885 | 1,615 | 4,901 | 3,564 |
| New York..... | 424 | 368 | 1,047 | 676 | 852 | 759 | 683 | 749 |
| Wisconsin..... | 396 | 406 | 268 | 697 | 787 | 544 | 570 | 374 |
| Oklahoma..... | 321 | 446 | 880 | 1,302 | 2,474 | 2,067 | 2,710 | 2,984 |
| Delaware..... | 262 | 138 | 77 | 77 | 47 | 10 | 2 | ----- |
| Texas..... | 213 | 130 | 798 | 303 | 1,208 | 1,829 | 1,745 | 3,450 |
| Maryland..... | 201 | 256 | 162 | 233 | 181 | 84 | 106 | 128 |
| Nebraska..... | 167 | 298 | 453 | 377 | 1,354 | 673 | 1,089 | 1,438 |
| Michigan..... | 142 | 36 | 39 | 256 | 36 | 102 | 47 | 45 |
| Kentucky..... | 81 | 68 | 459 | 171 | 105 | 504 | 542 | 621 |
| New Jersey..... | 63 | 71 | 227 | 15 | 107 | 113 | 305 | 130 |
| South Dakota..... | 45 | 16 | 17 | 321 | 88 | 132 | 150 | 497 |
| North Dakota..... | 4 | 650 | 595 | 436 | 427 | 445 | 620 | 1,140 |
| Other States..... | 138 | 154 | 307 | 289 | 1,190 | 1,368 | 1,774 | 2,331 |
| Total..... | 21,319 | 24,611 | 27,640 | 29,295 | 32,126 | 31,822 | 31,844 | 34,664 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

¹ Included in "Other States."

TABLE 477.—*Poultry, dressed: Receipts, gross weight, by State of origin, New York, by months, 1929*

| State | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Illinois | 2,171 | 1,081 | 1,826 | 1,645 | 1,229 | 1,428 | 1,157 | 1,254 | 1,802 | 2,608 | 3,706 | 4,796 |
| Indiana | 770 | 630 | 756 | 685 | 689 | 810 | 862 | 1,090 | 1,061 | 1,332 | 1,423 | 1,372 |
| Iowa | 2,341 | 1,272 | 1,147 | 500 | 305 | 1,241 | 1,832 | 1,874 | 2,904 | 4,745 | 5,450 | 7,128 |
| Missouri | 997 | 876 | 568 | 402 | 852 | 1,250 | 1,652 | 2,387 | 2,245 | 2,476 | 2,329 | 3,211 |
| Kansas | 1,849 | 1,033 | 839 | 769 | 966 | 1,280 | 1,656 | 1,788 | 2,536 | 2,589 | 2,943 | 2,200 |
| Texas | 1,690 | 1,059 | 1,136 | 1,215 | 957 | 910 | 672 | 781 | 619 | 460 | 5,066 | 3,821 |
| Ohio | 196 | 143 | 459 | 369 | 361 | 33 | 28 | 118 | 142 | 415 | 430 | 705 |
| Minnesota | 1,079 | 362 | 376 | 195 | 300 | 756 | 758 | 987 | 987 | 1,817 | 2,525 | 2,771 |
| Tennessee | 189 | 108 | 147 | 621 | 427 | 265 | 273 | 517 | 302 | 227 | 128 | 180 |
| Kentucky | 58 | 120 | 140 | 384 | 495 | 129 | 170 | 404 | 361 | 267 | 302 | 220 |
| New York | 100 | 217 | 432 | 823 | 1,686 | 1,988 | 2,379 | 2,064 | 1,269 | 843 | 526 | 192 |
| Nebraska | 806 | 660 | 248 | 282 | 393 | 570 | 408 | 697 | 805 | 973 | 1,156 | 1,082 |
| Oklahoma | 437 | 518 | 547 | 520 | 529 | 485 | 249 | 622 | 416 | 442 | 974 | 1,303 |
| Virginia | 7 | 9 | 1 | 21 | 86 | 138 | 273 | 515 | 287 | 190 | 276 | 210 |
| Michigan | 71 | 180 | 597 | 388 | 405 | ----- | 3 | 60 | 69 | 46 | 47 | 96 |
| Wisconsin | 92 | 49 | 38 | 133 | 31 | 2 | 38 | 47 | 20 | 66 | 240 | 178 |
| New Jersey | 48 | 35 | 15 | 6 | 25 | 5 | 7 | 25 | 6 | 6 | 14 | 19 |
| Maryland | 27 | 19 | 13 | 6 | 6 | 6 | 4 | 10 | 27 | 28 | 44 | 48 |
| Pennsylvania | 48 | 28 | 18 | 40 | 23 | 86 | 25 | 37 | 40 | 81 | 17 | 75 |
| South Dakota | 430 | 271 | 285 | 168 | 50 | 234 | 161 | 156 | 286 | 678 | 785 | 1,188 |
| Massachusetts | 4 | (1) | 35 | 25 | 39 | 31 | 58 | 3 | 3 | 13 | 55 | 81 |
| California | 54 | 727 | 168 | 134 | 139 | 36 | 241 | 22 | 29 | 37 | 153 | 13 |
| North Dakota | 116 | 115 | 47 | 6 | ----- | 83 | ----- | ----- | 29 | 28 | 701 | 716 |
| Arkansas | (1) | ----- | ----- | ----- | ----- | ----- | ----- | 24 | 143 | 83 | 149 | 43 |
| Delaware | 4 | 2 | 2 | 2 | (1) | 2 | 3 | 2 | 2 | 3 | 3 | 6 |
| Colorado | (1) | 28 | 23 | (1) | (1) | 14 | (1) | ----- | ----- | ----- | 140 | 393 |
| Washington | ----- | 90 | (1) | 24 | 185 | 25 | ----- | 126 | 84 | 31 | 23 | 31 |
| Idaho | 380 | 145 | 24 | ----- | ----- | ----- | ----- | 25 | ----- | ----- | 881 | 275 |
| Montana | 25 | 134 | 15 | 2 | ----- | ----- | ----- | ----- | ----- | ----- | 37 | 102 |
| Other States | 232 | 389 | 52 | 29 | 55 | 69 | 140 | 72 | 81 | 118 | 862 | 448 |
| Canada | ----- | ----- | ----- | (1) | ----- | ----- | ----- | ----- | ----- | (1) | 20 | (1) |
| Total | 14,221 | 10,900 | 9,064 | 9,520 | 10,233 | 11,876 | 13,078 | 15,707 | 16,558 | 20,602 | 31,495 | 32,903 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

¹ Not over 500 pounds.

TABLE 478.—*Frozen poultry: ¹ Cold-storage holdings, United States, 1916-1929*

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| 1916 | ----- | ----- | ----- | ----- | 17,847 | 6,559 | 6,216 | 7,032 | 8,882 | 20,041 | 31,175 | 27,139 |
| 1917 | 32,184 | 35,601 | 27,796 | 25,988 | 67,242 | 64,286 | 60,194 | 54,132 | 56,003 | 46,737 | 51,743 | 49,561 |
| 1918 | 64,537 | 68,238 | 56,950 | 44,115 | 26,523 | 18,929 | 17,652 | 18,766 | 23,034 | 29,798 | 41,433 | 71,238 |
| 1919 | 108,722 | 119,675 | 109,627 | 92,897 | 71,162 | 55,616 | 49,212 | 40,573 | 32,018 | 30,492 | 33,139 | 54,749 |
| 1920 | 87,512 | 92,253 | 78,421 | 61,436 | 40,525 | 30,535 | 24,790 | 22,364 | 21,331 | 22,953 | 31,070 | 49,046 |
| 1921 | 79,025 | 81,096 | 79,001 | 62,315 | 47,651 | 35,408 | 27,268 | 21,188 | 20,004 | 25,602 | 34,876 | 65,167 |
| 1922 | 103,697 | 103,350 | 88,709 | 68,471 | 50,840 | 38,602 | 34,837 | 30,659 | 27,671 | 25,084 | 30,238 | 51,781 |
| 1923 | 100,170 | 121,632 | 113,503 | 94,872 | 74,562 | 57,274 | 49,100 | 41,250 | 34,131 | 33,142 | 40,363 | 63,274 |
| 1924 | 93,434 | 99,486 | 93,497 | 76,067 | 52,068 | 39,299 | 34,886 | 33,604 | 33,837 | 40,070 | 55,139 | 87,939 |
| 1925 | 133,990 | 138,189 | 130,513 | 108,608 | 82,732 | 68,120 | 58,562 | 53,558 | 47,946 | 44,345 | 53,787 | 86,733 |
| 1926 | 111,501 | 108,512 | 95,397 | 73,124 | 52,783 | 42,808 | 36,730 | 35,793 | 38,634 | 44,771 | 64,842 | 106,854 |
| 1927 | 144,497 | 145,076 | 129,510 | 104,697 | 77,282 | 61,525 | 50,064 | 42,263 | 39,711 | 43,201 | 52,315 | 85,030 |
| 1928 | 117,490 | 118,154 | 103,494 | 83,169 | 56,832 | 43,872 | 38,230 | 40,395 | 40,749 | 43,578 | 58,093 | 79,173 |
| 1929 | 109,684 | 102,380 | 89,088 | 68,728 | 52,901 | 41,643 | 42,001 | 40,806 | 49,010 | 61,976 | 86,873 | 115,876 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

¹ Quantities given net weight.

TABLE 476.—*Poultry, dressed: Receipts, gross weight, at four markets, by State of origin, 1922-1929—Continued*

CHICAGO

| State | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|-------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Iowa..... | 19,001 | 18,654 | 21,023 | 21,538 | 21,420 | 14,719 | 13,117 | 18,505 |
| Illinois..... | 18,720 | 17,497 | 13,184 | 4,517 | 5,920 | 3,893 | 2,581 | 3,411 |
| Wisconsin..... | 7,555 | 7,372 | 7,771 | 5,384 | 5,701 | 3,982 | 3,409 | 4,811 |
| Minnesota..... | 7,310 | 10,764 | 11,425 | 10,267 | 12,586 | 10,541 | 7,829 | 13,833 |
| Missouri..... | 3,952 | 6,231 | 5,980 | 4,621 | 3,828 | 4,812 | 6,379 | 6,647 |
| South Dakota..... | 3,348 | 4,509 | 0,396 | 5,954 | 7,388 | 6,069 | 7,371 | 10,366 |
| North Dakota..... | 3,292 | 7,594 | 5,984 | 5,714 | 6,041 | 4,769 | 5,933 | 8,502 |
| Kansas..... | 2,499 | 3,602 | 3,252 | 3,411 | 4,110 | 2,915 | 4,315 | 5,108 |
| Nebraska..... | 1,959 | 1,813 | 1,690 | 2,149 | 2,632 | 3,247 | 4,295 | 4,169 |
| Indiana..... | 1,347 | 818 | 849 | 731 | 411 | 536 | 559 | 778 |
| Kentucky..... | 849 | 937 | 508 | 80 | 107 | 208 | 32 | 124 |
| Oklahoma..... | 801 | 2,217 | 2,164 | 2,476 | 1,998 | 2,250 | 2,712 | 2,830 |
| Texas..... | 709 | 4,507 | 4,077 | 1,802 | 1,378 | 2,577 | 3,302 | 6,830 |
| Tennessee..... | 694 | 810 | 564 | 186 | 371 | 377 | 361 | 483 |
| Michigan..... | 332 | 276 | 186 | 82 | 40 | 66 | 379 | 62 |
| Montana..... | 271 | 1,500 | 2,095 | 1,738 | 1,773 | 1,022 | 1,530 | 2,904 |
| Arkansas..... | 256 | 372 | 315 | 117 | 177 | 238 | 688 | 193 |
| New York..... | 247 | 335 | 339 | 385 | 837 | 715 | 661 | 837 |
| Mississippi..... | 169 | 94 | 49 | 12 | 3 | 6 | 7 | 38 |
| Idaho..... | 69 | 40 | 75 | 131 | 26 | 120 | 171 | 551 |
| Colorado..... | 63 | 80 | 169 | 390 | 222 | 228 | 293 | 378 |
| Wyoming..... | 17 | 39 | 109 | 81 | 98 | 133 | 260 | 373 |
| Other States..... | 173 | 182 | 260 | 179 | 194 | 312 | 941 | 1,635 |
| Canada..... | 28 | 30 | ----- | 141 | 371 | ----- | 55 | ----- |
| Total..... | 73,661 | 90,273 | 88,464 | 72,086 | 77,632 | 63,735 | 67,180 | 93,368 |

PHILADELPHIA

| Illinois..... | 7,165 | 9,497 | 9,456 | 8,728 | 5,505 | 4,232 | 1,940 | 1,531 |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Virginia..... | 2,241 | 2,588 | 2,448 | 2,331 | 1,745 | 1,458 | 1,097 | 1,166 |
| Indiana..... | 1,907 | 1,762 | 1,231 | 1,750 | 3,659 | 4,135 | 3,263 | 2,917 |
| Pennsylvania..... | 1,372 | 1,260 | 919 | 901 | 805 | 824 | 245 | 190 |
| Minnesota..... | 1,274 | 2,389 | 2,252 | 2,732 | 3,796 | 4,475 | 3,062 | 4,190 |
| Ohio..... | 1,153 | 820 | 1,206 | 741 | 507 | 696 | 491 | 397 |
| Missouri..... | 1,088 | 522 | 1,002 | 2,315 | 2,035 | 1,168 | 1,249 | 951 |
| Iowa..... | 1,017 | 1,124 | 1,883 | 2,700 | 3,536 | 4,179 | 4,962 | 5,558 |
| West Virginia..... | 985 | 957 | 982 | 1,034 | 797 | 410 | 291 | 313 |
| Kansas..... | 660 | 655 | 932 | 910 | 885 | 1,615 | 4,901 | 3,564 |
| New York..... | 424 | 368 | 1,047 | 676 | 852 | 759 | 683 | 749 |
| Wisconsin..... | 396 | 406 | 268 | 697 | 787 | 544 | 570 | 374 |
| Oklahoma..... | 321 | 446 | 880 | 1,302 | 2,474 | 2,067 | 2,710 | 2,084 |
| Delaware..... | 262 | 138 | 77 | 77 | 47 | 10 | 2 | ----- |
| Texas..... | 213 | 130 | 798 | 303 | 1,208 | 1,829 | 1,745 | 3,450 |
| Maryland..... | 201 | 256 | 162 | 233 | 181 | 84 | 106 | 128 |
| Nebraska..... | 167 | 298 | 453 | 377 | 1,354 | 673 | 1,089 | 1,438 |
| Michigan..... | 142 | 36 | 39 | 256 | 36 | 102 | 47 | 45 |
| Kentucky..... | 81 | 68 | 459 | 171 | 105 | 504 | 542 | 621 |
| New Jersey..... | 63 | 71 | 227 | 15 | 107 | 113 | 305 | 130 |
| South Dakota..... | 45 | 16 | 17 | 321 | 88 | 132 | 150 | 497 |
| North Dakota..... | 4 | 650 | 595 | 436 | 427 | 445 | 620 | 1,140 |
| Other States..... | 138 | 154 | 307 | 289 | 1,190 | 1,368 | 1,774 | 2,331 |
| Total..... | 21,319 | 24,611 | 27,640 | 29,295 | 32,126 | 31,822 | 31,844 | 34,664 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

¹ Included in "Other States."

TABLE 477.—*Poultry, dressed: Receipts, gross weight, by State of origin, New York, by months, 1929*

| State | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Illinois..... | 2,171 | 1,681 | 1,826 | 1,645 | 1,229 | 1,428 | 1,157 | 1,254 | 1,802 | 2,808 | 3,796 | 4,796 |
| Indiana..... | 770 | 630 | 756 | 685 | 689 | 810 | 862 | 1,090 | 1,061 | 1,332 | 1,423 | 1,372 |
| Iowa..... | 2,341 | 1,272 | 1,147 | 560 | 305 | 1,241 | 1,852 | 1,874 | 2,904 | 4,745 | 5,450 | 7,128 |
| Missouri..... | 937 | 876 | 568 | 462 | 852 | 1,250 | 1,652 | 2,387 | 2,245 | 2,476 | 2,329 | 3,211 |
| Kansas..... | 1,849 | 1,033 | 839 | 769 | 966 | 1,280 | 1,656 | 1,788 | 2,536 | 2,589 | 2,943 | 2,200 |
| Texas..... | 1,690 | 1,059 | 1,136 | 1,215 | 957 | 910 | 672 | 781 | 619 | 460 | 5,066 | 3,821 |
| Ohio..... | 196 | 143 | 459 | 369 | 361 | 33 | 28 | 118 | 142 | 415 | 430 | 705 |
| Minnesota..... | 1,079 | 302 | 376 | 195 | 300 | 756 | 758 | 987 | 987 | 1,817 | 2,525 | 2,771 |
| Tennessee..... | 189 | 108 | 147 | 621 | 427 | 265 | 273 | 517 | 302 | 227 | 128 | 180 |
| Kentucky..... | 58 | 120 | 140 | 384 | 495 | 129 | 170 | 404 | 361 | 207 | 302 | 220 |
| New York..... | 100 | 217 | 132 | 823 | 1,686 | 2,379 | 2,064 | 1,269 | 843 | 526 | 192 | 192 |
| Nebraska..... | 806 | 660 | 248 | 282 | 393 | 570 | 408 | 697 | 805 | 973 | 1,156 | 1,082 |
| Oklahoma..... | 437 | 518 | 517 | 520 | 529 | 485 | 249 | 622 | 416 | 442 | 974 | 1,303 |
| Virginia..... | 7 | 9 | 1 | 21 | 86 | 138 | 273 | 515 | 287 | 190 | 276 | 210 |
| Michigan..... | 71 | 180 | 597 | 388 | 405 | ----- | 3 | 60 | 69 | 46 | 47 | 96 |
| Wisconsin..... | 92 | 49 | 38 | 133 | 31 | 2 | 38 | 47 | 20 | 66 | 240 | 178 |
| New Jersey..... | 48 | 35 | 15 | 6 | 25 | 5 | 7 | 25 | 6 | 6 | 14 | 19 |
| Maryland..... | 27 | 19 | 13 | 0 | 0 | 0 | 4 | 10 | 27 | 28 | 44 | 48 |
| Pennsylvania..... | 49 | 28 | 18 | 46 | 23 | 86 | 25 | 37 | 40 | 81 | 17 | 75 |
| South Dakota..... | 430 | 271 | 285 | 168 | 50 | 234 | 161 | 156 | 286 | 678 | 785 | 1,188 |
| Massachusetts..... | 4 | (1) | 35 | 25 | 39 | 31 | 58 | 3 | 3 | 13 | 55 | 81 |
| California..... | 54 | 727 | 168 | 134 | 139 | 36 | 241 | 22 | 29 | 37 | 153 | 13 |
| North Dakota..... | 116 | 115 | 47 | 6 | ----- | 83 | ----- | 29 | 28 | 701 | 716 | ----- |
| Arkansas..... | (1) | ----- | ----- | ----- | ----- | ----- | ----- | 24 | 143 | 83 | 149 | 43 |
| Delaware..... | 4 | 2 | 2 | 2 | (1) | 2 | 3 | 2 | 2 | 3 | 3 | 6 |
| Colorado..... | (1) | 28 | 23 | (1) | (1) | 14 | (1) | ----- | ----- | ----- | 140 | 393 |
| Washington..... | ----- | 90 | (1) | 24 | 185 | 25 | ----- | 126 | 84 | 31 | 23 | 31 |
| Idaho..... | 380 | 145 | 24 | ----- | ----- | ----- | ----- | 25 | ----- | ----- | 881 | 275 |
| Montana..... | 25 | 134 | 15 | 2 | ----- | ----- | ----- | ----- | ----- | ----- | 37 | 102 |
| Other States..... | 232 | 389 | 52 | 20 | 55 | 69 | 140 | 72 | 81 | 118 | 862 | 448 |
| Canada..... | ----- | ----- | ----- | (1) | ----- | ----- | ----- | ----- | ----- | (1) | 20 | (1) |
| Total..... | 14,221 | 10,900 | 9,964 | 9,520 | 10,233 | 11,876 | 13,078 | 15,707 | 16,558 | 20,602 | 31,495 | 32,903 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

¹ Not over 500 pounds.

TABLE 478.—*Frozen poultry: ¹ Cold-storage holdings, United States, 1916-1929*

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| 1916..... | 32,184 | 35,601 | 27,796 | 25,988 | 17,847 | 6,559 | 6,216 | 7,032 | 8,882 | 20,041 | 31,175 | 27,139 |
| 1917..... | 64,557 | 68,238 | 56,950 | 44,115 | 26,523 | 18,929 | 17,652 | 18,756 | 23,034 | 29,798 | 41,433 | 71,238 |
| 1918..... | 108,722 | 119,675 | 109,627 | 92,897 | 71,162 | 55,616 | 49,212 | 40,573 | 32,918 | 30,492 | 33,139 | 54,749 |
| 1919..... | 87,512 | 92,253 | 78,421 | 61,436 | 40,525 | 30,535 | 24,790 | 22,364 | 21,331 | 22,953 | 31,070 | 49,046 |
| 1920..... | 79,025 | 81,096 | 79,001 | 62,315 | 47,651 | 35,408 | 27,268 | 21,188 | 20,064 | 25,602 | 34,876 | 65,167 |
| 1921..... | 103,697 | 103,350 | 88,709 | 68,471 | 50,840 | 38,602 | 34,837 | 30,659 | 27,671 | 25,984 | 30,238 | 51,781 |
| 1922..... | 100,170 | 121,632 | 113,503 | 94,872 | 74,562 | 57,274 | 49,100 | 41,250 | 34,131 | 33,142 | 40,363 | 63,274 |
| 1923..... | 93,434 | 99,486 | 93,497 | 76,067 | 52,068 | 39,299 | 34,886 | 33,601 | 33,837 | 40,070 | 55,139 | 87,939 |
| 1924..... | 133,990 | 138,189 | 130,513 | 108,608 | 82,732 | 68,126 | 58,562 | 53,558 | 47,946 | 44,345 | 53,787 | 86,733 |
| 1925..... | 111,501 | 108,512 | 95,397 | 73,124 | 52,783 | 42,808 | 36,730 | 35,793 | 38,634 | 44,771 | 64,842 | 106,854 |
| 1926..... | 144,497 | 145,076 | 129,610 | 104,697 | 77,282 | 61,525 | 50,064 | 42,293 | 39,711 | 43,201 | 52,315 | 85,030 |
| 1927..... | 117,490 | 118,154 | 103,494 | 83,169 | 56,832 | 43,872 | 38,230 | 40,395 | 40,749 | 43,578 | 58,033 | 79,173 |
| 1928..... | 109,684 | 102,380 | 89,088 | 68,728 | 52,901 | 41,643 | 42,001 | 40,896 | 49,010 | 61,976 | 86,873 | 115,876 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

¹ Quantities given net weight.

TABLE 479.—*Chickens: Estimated average price per pound, received by producers, United States, 1910-1929*

| Year beginning July— | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Apr. 15 | May 15 | June 15 | Weight- ed aver- age |
|-------------------------|------------|------------|-------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|----------------------------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1910..... | 12.2 | 12.0 | 11.8 | 11.4 | 11.0 | 10.6 | 10.6 | 10.6 | 10.7 | 10.9 | 11.0 | 11.1 | 11.0 |
| 1911..... | 11.2 | 11.2 | 11.0 | 10.6 | 10.0 | 9.7 | 10.0 | 10.4 | 10.6 | 11.0 | 11.1 | 11.0 | 10.4 |
| 1912..... | 11.2 | 11.3 | 11.4 | 11.4 | 11.0 | 10.8 | 10.8 | 11.0 | 11.4 | 11.7 | 11.9 | 12.0 | 11.2 |
| 1913..... | 13.0 | 12.8 | 12.7 | 13.0 | 11.4 | 11.3 | 11.5 | 12.0 | 12.4 | 13.0 | 12.7 | 13.1 | 12.0 |
| 1914..... | 13.4 | 13.1 | 12.8 | 12.0 | 11.1 | 10.7 | 10.9 | 11.3 | 11.7 | 11.9 | 12.0 | 12.2 | 11.5 |
| 1915..... | 12.2 | 12.2 | 12.0 | 11.8 | 11.5 | 11.2 | 11.5 | 12.1 | 12.5 | 13.1 | 13.6 | 14.0 | 12.0 |
| 1916..... | 14.1 | 14.1 | 14.2 | 14.4 | 13.9 | 13.6 | 14.1 | 15.1 | 15.7 | 17.3 | 17.5 | 17.7 | 14.6 |
| 1917..... | 17.4 | 16.7 | 18.4 | 18.5 | 17.0 | 17.5 | 18.4 | 20.3 | 20.2 | 20.7 | 20.6 | 21.3 | 18.4 |
| 1918..... | 23.2 | 23.4 | 23.6 | 22.2 | 21.7 | 22.4 | 22.1 | 21.8 | 23.4 | 25.7 | 26.7 | 26.4 | 23.0 |
| 1919..... | 26.8 | 26.1 | 25.0 | 23.3 | 22.0 | 22.0 | 23.3 | 25.7 | 26.9 | 28.4 | 28.0 | 27.4 | 24.2 |
| 1920..... | 28.4 | 26.6 | 26.9 | 24.6 | 22.9 | 20.6 | 21.7 | 22.3 | 22.8 | 22.2 | 21.8 | 21.5 | 22.8 |
| 1921..... | 21.7 | 21.4 | 20.2 | 19.1 | 18.6 | 18.2 | 18.9 | 19.0 | 19.4 | 20.0 | 20.2 | 20.6 | 19.3 |
| 1922..... | 20.7 | 18.9 | 18.6 | 18.1 | 17.2 | 17.2 | 17.3 | 18.6 | 18.8 | 19.4 | 20.1 | 20.3 | 18.2 |
| 1923..... | 20.6 | 19.8 | 19.7 | 19.0 | 17.7 | 16.6 | 17.5 | 18.2 | 18.9 | 19.4 | 20.3 | 20.5 | 18.3 |
| 1924..... | 20.2 | 20.0 | 19.8 | 19.4 | 18.5 | 17.9 | 18.5 | 19.1 | 20.0 | 21.1 | 22.0 | 21.6 | 19.2 |
| 1925..... | 21.4 | 20.8 | 20.4 | 20.0 | 19.2 | 19.5 | 20.9 | 21.5 | 21.9 | 23.1 | 23.7 | 23.9 | 20.7 |
| 1926..... | 23.6 | 22.1 | 21.4 | 20.8 | 20.0 | 19.8 | 20.1 | 21.1 | 21.3 | 21.8 | 21.7 | 20.2 | 20.7 |
| 1927..... | 19.9 | 19.7 | 19.4 | 19.7 | 19.4 | 19.2 | 19.6 | 20.1 | 20.1 | 20.8 | 21.5 | 21.5 | 19.8 |
| 1928..... | 21.9 | 21.6 | 22.3 | 22.0 | 21.5 | 21.2 | 21.6 | 22.1 | 22.7 | 23.8 | 24.4 | 24.6 | 22.1 |
| 1929..... | 23.7 | 22.7 | 22.4 | 21.5 | 20.3 | 19.1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by number 1919 census by States; yearly price obtained by weighting monthly prices by receipts of dressed poultry. Average price of chickens (live weight) of all ages as reported.

TABLE 480.—*Turkeys: Estimated average price per pound, received by producers, United States, 1912-1929*

| Year beginning October— | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Year beginning October— | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 |
|----------------------------|---------|---------|---------|---------|----------------------------|---------|---------|---------|---------|
| | Cents | Cents | Cents | Cents | | Cents | Cents | Cents | Cents |
| 1912..... | 13.6 | 14.4 | 14.8 | 14.9 | 1921..... | 25.7 | 28.2 | 32.5 | 30.7 |
| 1913..... | 14.6 | 15.2 | 15.5 | 15.5 | 1922..... | 25.1 | 29.5 | 32.3 | 29.7 |
| 1914..... | 14.1 | 14.1 | 14.5 | 14.5 | 1923..... | 26.6 | 27.9 | 24.5 | 23.1 |
| 1915..... | 13.7 | 14.8 | 15.5 | 15.6 | 1924..... | 23.3 | 24.2 | 25.8 | 26.2 |
| 1916..... | 17.0 | 18.6 | 19.6 | 19.5 | 1925..... | 24.0 | 28.3 | 31.1 | 31.7 |
| 1917..... | 20.0 | 21.0 | 23.0 | 22.9 | 1926..... | 26.6 | 29.8 | 32.8 | 31.6 |
| 1918..... | 23.9 | 25.7 | 27.0 | 27.3 | 1927..... | 26.4 | 30.8 | 32.3 | 29.8 |
| 1919..... | 26.6 | 28.3 | 31.1 | 32.0 | 1928..... | 27.2 | 31.2 | 30.5 | 28.2 |
| 1920..... | 30.0 | 31.8 | 33.1 | 33.0 | 1929..... | 27.2 | 27.1 | 23.5 | ----- |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by number 1919 Census by States.

TABLE 481.—*Eggs: Receipts at five markets, specified years*

BOSTON

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-----------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> | <i>1,000 cases</i> |
| 1927 ---- | 120 | 153 | 245 | 307 | 270 | 234 | 155 | 128 | 109 | 92 | 65 | 82 | 1,960 |
| 1928 ---- | 102 | 145 | 229 | 211 | 258 | 200 | 158 | 112 | 96 | 96 | 78 | 72 | 1,757 |
| 1929 ---- | 133 | 99 | 190 | 290 | 234 | 177 | 170 | 125 | 110 | 77 | 54 | 53 | 1,718 |

NEW YORK

| | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-------|-------|-----|-----|-----|-----|-----|-----|-----|-------|
| 1927 ---- | 458 | 542 | 863 | 1,004 | 1,038 | 716 | 521 | 441 | 386 | 355 | 319 | 315 | 7,048 |
| 1928 ---- | 412 | 613 | 931 | 1,052 | 1,089 | 767 | 591 | 494 | 407 | 392 | 208 | 272 | 7,288 |
| 1929 ---- | 394 | 371 | 821 | 1,061 | 999 | 837 | 668 | 526 | 444 | 380 | 293 | 335 | 7,129 |

PHILADELPHIA

| | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-------|
| 1927 ---- | 96 | 100 | 183 | 244 | 211 | 158 | 119 | 114 | 117 | 80 | 68 | 59 | 1,549 |
| 1928 ---- | 97 | 133 | 176 | 210 | 246 | 175 | 168 | 117 | 140 | 103 | 75 | 95 | 1,735 |
| 1929 ---- | 118 | 76 | 169 | 234 | 220 | 181 | 156 | 143 | 131 | 94 | 74 | 101 | 1,697 |

CHICAGO

| | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 1927 ---- | 243 | 326 | 628 | 1,002 | 935 | 594 | 363 | 255 | 231 | 127 | 101 | 96 | 4,901 |
| 1928 ---- | 200 | 366 | 592 | 813 | 849 | 562 | 356 | 284 | 241 | 150 | 75 | 113 | 4,601 |
| 1929 ---- | 206 | 222 | 554 | 924 | 709 | 554 | 342 | 301 | 210 | 135 | 62 | 89 | 4,398 |

SAN FRANCISCO

| | | | | | | | | | | | | | |
|-----------|----|----|-----|----|----|----|----|----|----|----|----|----|-----|
| 1927 ---- | 54 | 57 | 78 | 83 | 69 | 65 | 68 | 66 | 54 | 50 | 50 | 56 | 750 |
| 1928 ---- | 52 | 63 | 106 | 75 | 61 | 59 | 61 | 69 | 54 | 52 | 49 | 55 | 756 |
| 1929 ---- | 67 | 63 | 82 | 86 | 80 | 65 | 67 | 55 | 49 | 49 | 49 | 54 | 766 |

TOTAL

| | | | | | | | | | | | | | |
|-----------|-----|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-----|--------|
| 1910 ---- | 494 | 1,014 | 1,556 | 2,761 | 2,424 | 1,890 | 1,276 | 1,018 | 826 | 691 | 394 | 341 | 14,686 |
| 1920 ---- | 508 | 815 | 1,447 | 1,934 | 2,203 | 1,805 | 1,143 | 911 | 806 | 594 | 398 | 382 | 12,946 |
| 1921 ---- | 653 | 1,101 | 2,209 | 2,467 | 2,055 | 1,561 | 1,142 | 1,107 | 909 | 727 | 488 | 531 | 15,010 |
| 1922 ---- | 809 | 1,025 | 1,952 | 2,902 | 2,583 | 1,926 | 1,304 | 1,019 | 816 | 704 | 484 | 492 | 16,016 |
| 1923 ---- | 852 | 1,032 | 2,118 | 2,268 | 2,852 | 2,066 | 1,349 | 1,180 | 988 | 844 | 555 | 587 | 16,691 |
| 1924 ---- | 714 | 1,006 | 1,654 | 2,539 | 2,544 | 1,871 | 1,431 | 1,042 | 870 | 748 | 457 | 524 | 15,406 |
| 1925 ---- | 618 | 1,176 | 1,846 | 2,563 | 2,193 | 2,025 | 1,315 | 1,106 | 930 | 709 | 433 | 626 | 15,540 |
| 1926 ---- | 906 | 1,070 | 1,741 | 2,086 | 2,261 | 2,015 | 1,386 | 1,081 | 933 | 699 | 581 | 752 | 15,511 |
| 1927 ---- | 971 | 1,178 | 1,997 | 2,730 | 2,523 | 1,767 | 1,226 | 1,004 | 897 | 704 | 603 | 608 | 16,208 |
| 1928 ---- | 863 | 1,320 | 2,034 | 2,361 | 2,503 | 1,763 | 1,334 | 1,076 | 938 | 793 | 545 | 607 | 16,137 |
| 1929 ---- | 918 | 831 | 1,816 | 2,595 | 2,332 | 1,814 | 1,409 | 1,150 | 944 | 735 | 532 | 632 | 15,708 |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets. Reported in cases of 30 dozen. See 1927 Yearbook, p. 1098, for data for earlier years.

TABLE 482.—Eggs: Receipts by State of origin, 1922-1929

BOSTON

| State of origin | 1929 | | | | | | | | | | | 1928 | 1927 | 1926 | 1925 | 1924 | 1923 | 1922 |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Total | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | | | | | |
| Illinois | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases |
| Indiana | 251 | 24 | 7 | 17 | 45 | 27 | 18 | 14 | 10 | 8 | 9 | 9 | 7 | 327 | 691 | 845 | 710 | 710 |
| Iowa | 319 | 5 | 2 | 14 | 35 | 26 | 16 | 13 | 7 | 7 | 3 | 2 | 3 | 350 | 891 | 845 | 320 | 320 |
| Minnesota | 211 | 6 | 3 | 7 | 34 | 35 | 26 | 13 | 10 | 8 | 3 | 9 | 7 | 163 | 185 | 233 | 320 | 320 |
| Missouri | 194 | 8 | 4 | 5 | 42 | 38 | 32 | 41 | 28 | 25 | 16 | 7 | 2 | 259 | 186 | 146 | 142 | 142 |
| Ohio | 236 | 53 | 1 | 2 | 8 | 8 | 6 | 35 | 20 | 17 | 11 | 4 | 4 | 209 | 191 | 108 | 108 | 108 |
| Missouri | 58 | 6 | 1 | 2 | 9 | 6 | 6 | 35 | 5 | 6 | 3 | (1) | 5 | 39 | 75 | 87 | 108 | 108 |
| Maine | 131 | 10 | 10 | 28 | 23 | 15 | 6 | 8 | 2 | 6 | 3 | (1) | 5 | 155 | 80 | 100 | 100 | 100 |
| Kansas | 84 | 9 | 7 | 9 | 9 | 9 | 6 | 4 | 3 | 3 | 2 | 2 | 1 | 100 | 99 | 99 | 99 | 99 |
| Michigan | 244 | 23 | 19 | 35 | 21 | 28 | 16 | 23 | 23 | 22 | 18 | 13 | 12 | 174 | 57 | 61 | 83 | 83 |
| New York | 36 | 2 | 1 | 1 | 6 | 3 | 1 | 3 | 4 | 3 | 2 | 1 | 1 | 40 | 43 | 43 | 40 | 40 |
| New Hampshire | 31 | 4 | 2 | 1 | 3 | 3 | 1 | 3 | 2 | 2 | 1 | 1 | 1 | 36 | 38 | 36 | 36 | 36 |
| Vermont | 22 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | (1) | 1 | 32 | 25 | 21 | 38 | 38 |
| Massachusetts | 17 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | (1) | 1 | 17 | 15 | 15 | 19 | 19 |
| Nebraska | 16 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | (1) | 1 | 12 | 12 | 12 | 24 | 24 |
| Other States | 94 | 12 | 14 | 27 | 22 | 15 | 8 | 9 | 7 | 8 | (1) | 2 | 1 | 91 | 31 | 19 | 19 | 19 |
| Total | 215 | 15 | 26 | 38 | 31 | 17 | 19 | 16 | 11 | 5 | 5 | 10 | 7 | 159 | 80 | 64 | 100 | 100 |
| Total | 1,718 | 133 | 99 | 190 | 290 | 284 | 177 | 176 | 125 | 110 | 77 | 54 | 53 | 1,883 | 1,829 | 1,944 | 1,970 | 1,970 |

CHICAGO

| | | | | | | | | | | | | | | | | | | |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Missouri | 1,045 | 890 | 661 | 604 | 655 | 832 | 874 | 506 | 18 | 23 | 85 | 122 | 108 | 78 | 33 | 31 | 23 | 16 |
| Iowa | 843 | 906 | 802 | 888 | 875 | 927 | 826 | 804 | 35 | 44 | 88 | 182 | 187 | 109 | 65 | 53 | 42 | 11 |
| Kansas | 532 | 501 | 435 | 459 | 403 | 477 | 446 | 413 | 13 | 17 | 64 | 88 | 95 | 96 | 40 | 23 | 23 | 9 |
| Wisconsin | 474 | 584 | 592 | 473 | 483 | 503 | 437 | 413 | 31 | 30 | 34 | 86 | 95 | 90 | 21 | 28 | 37 | 5 |
| Minnesota | 462 | 610 | 644 | 573 | 618 | 583 | 545 | 588 | 39 | 39 | 52 | 130 | 187 | 174 | 71 | 50 | 28 | 7 |
| South Dakota | 405 | 551 | 595 | 564 | 514 | 485 | 445 | 445 | 12 | 9 | 30 | 71 | 81 | 74 | 52 | 44 | 30 | 11 |
| Nebraska | 359 | 359 | 465 | 504 | 464 | 420 | 438 | 429 | 24 | 22 | 75 | 74 | 56 | 60 | 34 | 36 | 14 | 2 |
| Illinois | 310 | 256 | 194 | 170 | 178 | 132 | 120 | 184 | 6 | 5 | 17 | 69 | 56 | 5 | 5 | 7 | 7 | 2 |
| Oklahoma | 103 | 101 | 12 | 87 | 10 | 82 | 96 | 68 | 8 | 6 | 39 | 18 | 4 | 3 | 1 | (1) | (1) | 2 |
| North Dakota | 223 | 33 | 46 | 42 | 53 | 27 | 38 | 45 | 2 | 1 | 3 | 14 | 9 | 2 | (1) | (1) | (1) | (1) |
| Texas | 22 | 49 | 25 | 14 | 13 | 36 | 57 | 67 | 2 | 5 | 29 | 21 | 7 | 2 | (1) | (1) | 2 | 1 |
| Michigan | 18 | 18 | 20 | 15 | 23 | 37 | 37 | 40 | 1 | 1 | 7 | 6 | 1 | 7 | (1) | (1) | (1) | (1) |
| Arkansas | 14 | 20 | 3 | 13 | 23 | 48 | 32 | 32 | 1 | (1) | 3 | 1 | 1 | 1 | (1) | (1) | 14 | 15 |
| Other States | 81 | 51 | 37 | 104 | 241 | 332 | 338 | 260 | 17 | 20 | 30 | 62 | 38 | 16 | 10 | 14 | 14 | 89 |
| Total | 4,684 | 5,009 | 4,679 | 4,498 | 4,575 | 4,901 | 4,601 | 4,398 | 206 | 222 | 554 | 924 | 799 | 554 | 342 | 301 | 210 | 62 |

NEW YORK

| | | | | | | | | | | | | | | | | | | | | |
|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|
| Illinois..... | 1,379 | 1,342 | 1,223 | 1,253 | 939 | 950 | 869 | 771 | 37 | 33 | 85 | 156 | 120 | 97 | 76 | 48 | 37 | 29 | 21 | 32 |
| Iowa..... | 921 | 931 | 942 | 924 | 1,102 | 1,038 | 1,071 | 1,437 | 12 | 17 | 61 | 230 | 252 | 212 | 155 | 113 | 84 | 52 | 18 | 10 |
| Indiana..... | 726 | 755 | 826 | 568 | 542 | 596 | 468 | 437 | 12 | 9 | 52 | 108 | 76 | 67 | 46 | 31 | 17 | 4 | 5 | 8 |
| Ohio..... | 514 | 436 | 327 | 324 | 394 | 356 | 276 | 204 | 7 | 3 | 14 | 46 | 35 | 36 | 24 | 15 | 35 | 7 | 5 | 39 |
| New York..... | 491 | 645 | 615 | 685 | 637 | 605 | 666 | 604 | 57 | 41 | 63 | 93 | 93 | 81 | 38 | 46 | 16 | 27 | 17 | 18 |
| Missouri..... | 438 | 453 | 415 | 364 | 351 | 342 | 349 | 343 | 22 | 27 | 68 | 47 | 59 | 30 | 34 | 22 | 32 | 54 | 56 | 46 |
| California..... | 354 | 430 | 331 | 456 | 439 | 502 | 559 | 581 | 45 | 54 | 77 | 30 | 43 | 36 | 38 | 42 | 13 | 1 | 1 | 11 |
| Pennsylvania..... | 265 | 238 | 274 | 244 | 240 | 195 | 191 | 113 | 14 | 12 | 19 | 23 | 23 | 20 | 17 | 18 | 13 | 1 | 1 | 1 |
| Tennessee..... | 251 | 249 | 141 | 139 | 120 | 185 | 186 | 113 | 8 | 16 | 44 | 26 | 4 | 4 | 5 | 1 | 12 | 1 | 1 | 1 |
| Kansas..... | 212 | 264 | 181 | 197 | 237 | 214 | 250 | 318 | 14 | 18 | 54 | 34 | 49 | 34 | 31 | 22 | 21 | 20 | 12 | 8 |
| Minnesota..... | 227 | 264 | 261 | 246 | 201 | 178 | 204 | 195 | 4 | 2 | 10 | 20 | 20 | 29 | 29 | 17 | 22 | 18 | 7 | 8 |
| Washington..... | 143 | 103 | 271 | 375 | 543 | 655 | 661 | 609 | 76 | 52 | 48 | 35 | 39 | 50 | 52 | 54 | 64 | 71 | 61 | 67 |
| Kentucky..... | 133 | 101 | 61 | 74 | 69 | 97 | 63 | 23 | 1 | 1 | 6 | 9 | 1 | 1 | 1 | 1 | 12 | 10 | 11 | 15 |
| New Jersey..... | 134 | 199 | 222 | 216 | 213 | 194 | 180 | 214 | 16 | 17 | 25 | 29 | 27 | 21 | 17 | 14 | 12 | 4 | 4 | 1 |
| Pennsylvania..... | 100 | 107 | 97 | 70 | 56 | 36 | 46 | 42 | 3 | 6 | 2 | 4 | 10 | 4 | 3 | 3 | 2 | 4 | 4 | 1 |
| Michigan..... | 84 | 124 | 124 | 118 | 118 | 111 | 131 | 88 | 5 | 7 | 13 | 12 | 11 | 8 | 6 | 7 | 6 | 3 | 2 | 3 |
| Virginia..... | 65 | 99 | 104 | 92 | 80 | 111 | 102 | 89 | 5 | 6 | 16 | 8 | 8 | 8 | 4 | 7 | 1 | 3 | 1 | 8 |
| Wisconsin..... | 54 | 54 | 68 | 90 | 78 | 54 | 54 | 39 | 2 | (1) | 5 | 6 | 3 | 3 | 2 | 1 | (1) | 1 | 2 | 2 |
| Delaware..... | 52 | 63 | 82 | 80 | 80 | 87 | 72 | 29 | 2 | 4 | 16 | 17 | 21 | 21 | 18 | 14 | 9 | 12 | 4 | 4 |
| Nebraska..... | 38 | 55 | 57 | 56 | 55 | 64 | 132 | 145 | 6 | 3 | 16 | 17 | 21 | 52 | 47 | 41 | 37 | 33 | 30 | 34 |
| Other States..... | 230 | 273 | 238 | 265 | 324 | 451 | 698 | 666 | 40 | 43 | 143 | 110 | 56 | | | | | | | |
| Total..... | 6,921 | 7,156 | 6,543 | 6,894 | 6,818 | 7,048 | 7,238 | 7,129 | 394 | 371 | 821 | 1,061 | 999 | 837 | 668 | 526 | 444 | 380 | 293 | 335 |

PHILADELPHIA

| | | | | | | | | | | | | | | | | | | | | |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Illinois..... | 274 | 312 | 304 | 294 | 189 | 110 | 124 | 113 | 12 | 2 | 3 | 10 | 11 | 13 | 11 | 12 | 10 | 5 | 6 | 18 |
| Missouri..... | 152 | 147 | 134 | 131 | 260 | 221 | 183 | 167 | 10 | 3 | 1 | 13 | 15 | 20 | 21 | 2 | 17 | 11 | 6 | 3 |
| Indiana..... | 149 | 125 | 103 | 98 | 113 | 129 | 90 | 86 | 1 | (1) | 3 | 10 | 10 | 11 | 7 | 5 | 2 | 3 | 3 | 2 |
| Ohio..... | 137 | 174 | 155 | 153 | 109 | 97 | 273 | 274 | 19 | 18 | 39 | 47 | 46 | 10 | 8 | 11 | 11 | 3 | 2 | 12 |
| Pennsylvania..... | 145 | 163 | 148 | 123 | 113 | 95 | 61 | 57 | 3 | (1) | 9 | 15 | 7 | 32 | 23 | 15 | 3 | 5 | 3 | 3 |
| Michigan..... | 144 | 149 | 153 | 120 | 99 | 129 | 125 | 108 | 5 | (1) | 2 | 24 | 16 | 16 | 5 | 6 | 3 | 2 | 1 | 2 |
| Virginia..... | 71 | 80 | 106 | 109 | 105 | 127 | 128 | 126 | 4 | (1) | 3 | 11 | 19 | 16 | 17 | 1 | 19 | 9 | 2 | 2 |
| Iowa..... | 68 | 66 | 58 | 55 | 38 | 35 | 38 | 43 | 2 | 3 | 14 | 18 | 5 | 25 | 22 | 1 | 29 | 21 | 12 | 1 |
| Maryland..... | 63 | 75 | 84 | 113 | 104 | 151 | 190 | 218 | 13 | 3 | 11 | 10 | 24 | 1 | 22 | 32 | (1) | 2 | (1) | 8 |
| Minnesota..... | 61 | 25 | 12 | 27 | 15 | 89 | 62 | 15 | 1 | 1 | 8 | 3 | 4 | 1 | 11 | (1) | (1) | 5 | 4 | (1) |
| Kansas..... | 48 | 70 | 45 | 43 | 68 | 60 | 41 | 71 | 5 | 1 | 7 | 3 | 11 | 6 | 7 | 5 | 6 | 5 | 1 | 6 |
| Delaware..... | 46 | 53 | 46 | 35 | 23 | 16 | 38 | 51 | 3 | 4 | 8 | 10 | 9 | 7 | 4 | 2 | 1 | 1 | 1 | 2 |
| Wisconsin..... | 20 | 34 | 34 | 37 | 53 | 46 | 36 | 52 | 2 | 1 | 2 | 1 | 10 | 6 | 7 | 5 | 3 | 1 | 2 | 2 |
| West Virginia..... | 27 | 26 | 21 | 17 | 9 | 13 | 24 | 5 | 9 | 1 | (1) | 1 | 1 | (1) | (1) | (1) | (1) | (1) | 4 | 7 |
| New York..... | 17 | 35 | 26 | 29 | 19 | 30 | 29 | 34 | 6 | 4 | 7 | 1 | 2 | 5 | 4 | 1 | 3 | 6 | 1 | 1 |
| Nebraska..... | 15 | 36 | 15 | 17 | 46 | 30 | 23 | 34 | 6 | 2 | 22 | 29 | 18 | 12 | 4 | 9 | 22 | 17 | 19 | 21 |
| Other States..... | 98 | 57 | 48 | 92 | 103 | 129 | 234 | 213 | 19 | 23 | 22 | 20 | | | | | | | | |
| Total..... | 1,703 | 1,727 | 1,595 | 1,572 | 1,566 | 1,549 | 1,735 | 1,697 | 118 | 76 | 169 | 234 | 220 | 181 | 156 | 143 | 131 | 94 | 74 | 101 |

1 Not over 500 cases.

TABLE 482.—Eggs: Receipts by State of origin, 1922-1929—Continued

SAN FRANCISCO

| State of origin | 1929 | | | | | | | | | | | | | | | | | | | |
|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | Total | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
| California..... | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases |
| Oregon..... | 824 | 825 | 737 | 686 | 710 | 705 | 710 | 737 | 66 | 63 | 81 | 83 | 77 | 63 | 60 | 50 | 46 | 48 | 48 | 52 |
| Washington..... | 7 | 13 | 10 | 37 | 16 | 19 | 23 | 18 | 1 | 1 | 1 | 2 | 1 | 1 | 5 | 2 | 1 | 1 | 1 | 2 |
| Idaho..... | 6 | 10 | 6 | 11 | 6 | 17 | 6 | 4 | (1) | --- | --- | --- | --- | (1) | 1 | 1 | 2 | --- | (1) | --- |
| Other States..... | 1 | 6 | 3 | 6 | 10 | 6 | 13 | 3 | (1) | --- | --- | 1 | 1 | --- | (1) | 1 | (1) | --- | --- | --- |
| Total..... | 838 | 855 | 760 | 743 | 744 | 750 | 756 | 766 | 67 | 63 | 82 | 86 | 80 | 65 | 67 | 55 | 49 | 49 | 49 | 52 |

LOS ANGELES

| | | | | | | | | | | | | | |
|-------------------|-----|-----|-----|-----|-----|-----|----|-----|----|-----|----|-----|-----|
| California..... | 641 | 47 | 45 | 79 | 92 | 83 | 66 | 59 | 46 | 32 | 34 | 59 | (1) |
| Idaho..... | 31 | (1) | --- | 1 | 5 | 6 | 10 | 3 | 4 | 1 | 1 | (1) | --- |
| Oregon..... | 18 | 1 | (1) | 2 | 1 | 1 | 3 | --- | 2 | (1) | 4 | 3 | (1) |
| Utah..... | 20 | 1 | (1) | 1 | 3 | 4 | 3 | 4 | 4 | 2 | 1 | (1) | --- |
| Other States..... | 25 | 2 | (1) | --- | 3 | 6 | 1 | 2 | 1 | 5 | 4 | 1 | --- |
| Total..... | 735 | 51 | 45 | 83 | 104 | 100 | 83 | 68 | 55 | 39 | 44 | 63 | --- |

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets. Reported in cases of 30 dozen.

1 Not over 500 cases.

TABLE 483.—*Case eggs:*¹ *Cold-storage holdings, United States, 1915-1929*

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases | 1,000 cases |
| 1915..... | | | | | | | | 5,029 | 5,683 | 5,019 | 3,687 | 2,788 |
| 1916..... | 1,508 | 458 | 35 | 264 | 2,327 | 4,593 | 5,574 | 6,060 | 5,600 | 4,868 | 3,985 | 2,146 |
| 1917..... | 920 | 149 | 7 | 190 | 2,105 | 4,922 | 6,617 | 6,895 | 6,436 | 5,837 | 4,638 | 2,948 |
| 1918..... | 1,300 | 200 | 20 | 344 | 2,957 | 5,499 | 6,554 | 6,568 | 6,265 | 5,369 | 3,812 | 2,071 |
| 1919..... | 740 | 130 | 26 | 320 | 3,278 | 6,098 | 7,659 | 7,850 | 7,685 | 6,858 | 5,087 | 3,341 |
| 1920..... | 1,542 | 342 | 29 | 122 | 2,135 | 5,143 | 6,747 | 6,872 | 6,372 | 5,295 | 3,838 | 1,824 |
| 1921..... | 408 | 43 | 43 | 1,926 | 4,909 | 6,844 | 7,534 | 7,605 | 7,210 | 6,269 | 4,380 | 2,403 |
| 1922..... | 889 | 179 | 13 | 950 | 4,648 | 8,056 | 9,811 | 10,161 | 9,608 | 7,924 | 5,726 | 3,257 |
| 1923..... | 1,311 | 213 | 13 | 453 | 3,737 | 7,890 | 10,222 | 10,509 | 9,883 | 8,737 | 6,645 | 4,028 |
| 1924..... | 1,927 | 500 | 44 | 579 | 3,563 | 6,875 | 8,685 | 9,267 | 8,778 | 7,409 | 5,267 | 3,102 |
| 1925..... | 1,050 | 81 | 21 | 1,240 | 4,872 | 7,712 | 9,482 | 10,024 | 9,873 | 8,612 | 6,322 | 3,786 |
| 1926..... | 1,683 | 578 | 77 | 872 | 3,735 | 7,236 | 9,133 | 9,845 | 9,573 | 8,048 | 6,888 | 3,215 |
| 1927..... | 1,096 | 253 | 92 | 1,868 | 5,501 | 8,962 | 10,565 | 10,746 | 9,650 | 7,960 | 6,485 | 2,956 |
| 1928..... | 882 | 26 | 06 | 1,087 | 4,515 | 8,168 | 10,002 | 10,496 | 9,944 | 8,542 | 6,247 | 3,542 |
| 1929..... | 1,415 | 248 | 11 | 559 | 3,952 | 6,705 | 8,510 | 8,962 | 8,547 | 7,195 | 4,930 | 2,631 |

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

¹ 30-dozen cases.TABLE 484.—*Frozen eggs:*¹ *Cold-storage holdings, United States, 1916-1929*

| Year | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sept. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| 1916..... | | | | | 3,133 | 4,176 | 5,410 | 5,822 | 5,223 | 6,457 | 6,307 | 5,104 |
| 1917..... | 2,737 | 1,724 | 1,334 | 2,394 | 3,329 | 7,558 | 13,308 | 15,384 | 19,741 | 17,585 | 16,424 | 13,979 |
| 1918..... | 14,603 | 12,207 | 9,746 | 9,001 | 9,488 | 11,555 | 12,895 | 15,240 | 15,871 | 14,757 | 13,281 | 11,832 |
| 1919..... | 8,980 | 7,760 | 6,931 | 5,980 | 8,046 | 11,568 | 16,472 | 19,024 | 21,017 | 20,687 | 18,976 | 22,690 |
| 1920..... | 19,286 | 16,394 | 13,836 | 11,039 | 10,529 | 13,939 | 17,388 | 20,055 | 21,901 | 23,584 | 20,461 | 29,945 |
| 1921..... | 27,325 | 24,927 | 22,363 | 20,873 | 21,730 | 26,822 | 27,737 | 27,952 | 27,408 | 26,656 | 26,114 | 22,899 |
| 1922..... | 19,290 | 16,209 | 13,193 | 10,473 | 14,154 | 18,273 | 23,528 | 27,855 | 34,516 | 33,545 | 30,523 | 26,233 |
| 1923..... | 22,787 | 18,517 | 14,603 | 10,311 | 12,921 | 20,730 | 29,680 | 36,192 | 37,280 | 43,836 | 40,424 | 36,004 |
| 1924..... | 32,087 | 27,682 | 23,106 | 20,736 | 23,707 | 29,956 | 33,565 | 35,184 | 34,128 | 31,006 | 26,633 | 22,100 |
| 1925..... | 21,303 | 16,292 | 11,364 | 11,353 | 19,579 | 29,544 | 38,379 | 42,855 | 47,099 | 44,299 | 45,314 | 39,336 |
| 1926..... | 33,905 | 29,256 | 24,167 | 21,849 | 25,739 | 34,815 | 45,688 | 51,810 | 52,634 | 51,062 | 44,966 | 38,620 |
| 1927..... | 33,593 | 31,207 | 26,053 | 33,272 | 52,053 | 71,605 | 81,263 | 81,418 | 77,508 | 71,208 | 62,066 | 54,703 |
| 1928..... | 47,020 | 38,573 | 31,362 | 34,411 | 51,532 | 67,941 | 77,744 | 81,670 | 89,196 | 82,255 | 73,327 | 64,201 |
| 1929..... | 56,181 | 48,055 | 38,250 | 34,918 | 51,825 | 71,560 | 84,766 | 91,488 | 86,693 | 81,541 | 70,331 | 61,772 |

Bureau of Agricultural Economics. Compiled from reports from cold storage establishments.

¹ Quantities given are net weight.

TABLE 485.—*Eggs in the shell: International trade, average 1909-1913, annual 1925-1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|---------------------|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | Average 1909-1913 | | 1925 | | 1926 | | 1927 | | 1928 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 dozen</i> | <i>1,000 dozen</i> | <i>1,000 dozen</i> | <i>1,000 dozen</i> | <i>1,000 dozen</i> | <i>1,000 dozen</i> | <i>1,000 dozen</i> | <i>1,000 dozen</i> | <i>1,000 dozen</i> | <i>1,000 dozen</i> |
| China..... | 270 | 25,542 | 0 | 65,376 | 0 | 63,230 | 0 | 50,235 | 0 | 52,059 |
| Denmark..... | 2,243 | 34,340 | 473 | 67,225 | 192 | 60,351 | 284 | 70,405 | 153 | 65,750 |
| Netherlands..... | 19,542 | 29,360 | 8,447 | 71,063 | 9,620 | 86,414 | 10,502 | 103,614 | 11,376 | 111,145 |
| Irish Free State..... | 0 | 0 | 611 | 43,592 | 440 | 43,662 | 372 | 49,462 | 547 | 50,465 |
| Poland..... | 0 | 0 | 1,302 | 39,787 | 82 | 86,076 | 184 | 96,400 | 601 | 80,190 |
| United States..... | ¹ 1,701 | 12,108 | 609 | 24,999 | 208 | 26,634 | 250 | 28,707 | 286 | 20,192 |
| Italy..... | 4,104 | 33,482 | 6,872 | 44,612 | 10,226 | 31,535 | 22,379 | 20,700 | 26,589 | 17,676 |
| Morocco..... | | ² 5,653 | 0 | 15,654 | 0 | 15,614 | 0 | 11,983 | 0 | |
| Belgium..... | 19,148 | 11,521 | 2,909 | 18,003 | 790 | 32,969 | 994 | 39,956 | 915 | 57,083 |
| Egypt..... | ¹ 101 | 9,690 | 11 | 13,174 | 1 | 8,939 | 0 | 9,197 | 14 | 10,625 |
| Hungary..... | ³ 91,561 | ³ 177,103 | 310 | 21,010 | 234 | 24,749 | 302 | 20,933 | 410 | 12,999 |
| Bulgaria..... | 55 | 16,512 | 0 | 16,219 | 0 | 17,391 | 0 | 18,335 | 0 | 15,650 |
| Rumania..... | 18 | 12,323 | 0 | 15,891 | 1 | 16,683 | | | | |
| Lithuania..... | 0 | 0 | 0 | 5,415 | 0 | 5,787 | 0 | 5,349 | 0 | 5,388 |
| Algeria..... | 86 | 187 | 1 | 4,835 | 2 | 7,010 | | 4,702 | | 5,762 |
| Union of South Africa..... | 1,382 | ⁴ 90 | 184 | 2,592 | 62 | 2,609 | 126 | 3,446 | 145 | 3,644 |
| Sweden..... | 4,207 | 3,781 | 933 | 1,153 | 1,560 | 2,619 | 215 | 5,485 | 334 | 5,432 |
| Estonia..... | 0 | 0 | 0 | 1,096 | 0 | 884 | 0 | 1,340 | 10 | 1,960 |
| Finland..... | 2,899 | 3 | 54 | 114 | 23 | 83 | 17 | 26 | | |
| Norway..... | 387 | 4 | 127 | 1,129 | 126 | 452 | 84 | 98 | 102 | 178 |
| Russia..... | 18,061 | 274,891 | | 87,248 | | 43,808 | | 102,186 | | 141,410 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 190,015 | 0 | 216,828 | 713 | 220,741 | 500 | 243,012 | 965 | 264,674 | |
| Germany..... | 228,279 | 675 | 203,045 | 1,547 | 196,852 | 182 | 225,118 | 286 | 245,649 | 685 |
| Japan..... | 6,967 | 0 | 28,822 | 0 | 25,462 | 0 | 21,700 | 0 | 16,140 | 0 |
| Spain..... | 7,404 | 618 | 19,048 | 15 | 25,318 | 20 | | | | |
| Switzerland..... | 19,747 | 48 | 17,337 | 10 | 17,198 | 10 | 16,159 | 12 | 16,964 | 17 |
| France..... | 37,215 | 8,920 | 7,382 | 5,168 | 7,337 | 17,020 | 9,435 | 15,863 | 15,199 | 59,691 |
| Austria..... | 0 | 0 | 16,460 | 0 | 22,315 | 1,732 | 24,780 | 2,002 | 25,692 | 1,727 |
| Cuba..... | 4,732 | 0 | 11,937 | 0 | 11,774 | 0 | 11,220 | 0 | | |
| Philippine Islands..... | 4,315 | 0 | 5,754 | 0 | 4,942 | 0 | 5,728 | 0 | 6,016 | 0 |
| Mexico..... | ² 824 | 0 | 5,188 | 1 | | | 5,009 | | 3,903 | |
| Canada..... | 6,341 | 148 | 2,722 | 2,466 | 3,560 | 1,777 | 3,227 | 448 | 967 | 988 |
| Argentina..... | 2,351 | 0 | 6,321 | 3,585 | 8,477 | 1,475 | 10,976 | 977 | | 1,073 |
| Czechoslovakia..... | 0 | 0 | 1,944 | 495 | 4,032 | 1,437 | 4,287 | 3,287 | 7,205 | 1,979 |
| Total 34 countries..... | 673,875 | 657,059 | 565,631 | 374,187 | 571,665 | 610,652 | 616,360 | 666,399 | 643,921 | 723,797 |

Bureau of Agricultural Economics. Official sources, unless otherwise specified. In countries reporting other than dozens of eggs, the conversion factor used is 1½ lbs. equals one dozen.

¹ 1 year only.

² 2-year average.

³ Average for Austria-Hungary.

⁴ 4-year average.

TABLE 486.—*Eggs, not in the shell: International trade, average 1909–1913, annual 1925–1928*

| Country | Year ended Dec. 31 | | | | | | | | | |
|-------------------------------|--------------------|------------------|------------|------------|------------|------------|------------|------------|------------------|------------|
| | Average 1909–1913 | | 1925 | | 1926 | | 1927 | | 1928 preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. |
| China..... | 0 | 17, 217 | 0 | 133, 895 | 0 | 132, 471 | 0 | 100, 856 | 0 | 126, 803 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | | | 53, 599 | 913 | 65, 235 | 613 | 70, 058 | 466 | 65, 372 | 508 |
| United States..... | ¹ 394 | (²) | 33, 987 | 301 | 25, 738 | 522 | 15, 341 | 661 | 23, 474 | 2, 385 |
| Germany..... | 11, 214 | 3, 225 | 13, 958 | 1, 989 | 14, 559 | 2, 157 | 17, 836 | 1, 544 | 19, 362 | 144 |
| France..... | 3, 297 | 851 | 5, 061 | 276 | 5, 893 | 124 | 4, 978 | 175 | 10, 583 | 1, 064 |
| Netherlands..... | 0 | 0 | 4, 304 | 917 | 3, 882 | 665 | 3, 970 | 862 | 4, 133 | 28 |
| Italy..... | 381 | 4 | 1, 291 | 19 | 1, 318 | 0 | 953 | 27 | 1, 484 | 0 |
| Canada..... | (²) | (²) | 1, 507 | 0 | 1, 379 | 0 | 2, 025 | 0 | 3, 030 | 13 |
| Irish Free State..... | | | 1, 091 | 19 | 1, 022 | 22 | 1, 090 | 37 | 883 | 188 |
| Belgium..... | | | 980 | 100 | 795 | 112 | 1, 110 | 85 | 1, 185 | 1 |
| Sweden..... | ³ 255 | 0 | 804 | 2 | 758 | 20 | 674 | 0 | 828 | 0 |
| Denmark..... | 526 | 46 | 780 | 16 | 569 | 3 | 461 | 6 | | 0 |
| Czechoslovakia..... | 0 | 0 | 737 | 5 | 568 | 23 | 14 | 2 | 0 | 0 |
| Union of South Africa..... | (²) | (²) | 122 | 16 | 71 | 62 | 40 | 5 | 24 | 0 |
| Norway..... | 174 | 0 | 8 | 0 | 12 | 0 | 6 | 0 | | 0 |
| Total 15 countries..... | 16, 241 | 21, 303 | 118, 229 | 138, 468 | 121, 799 | 136, 794 | 118, 556 | 104, 726 | 130, 358 | 131, 134 |

Bureau of Agricultural Economics. Compiled from official sources.

¹ 4-year average.² Stated in value only.³ 2-year average.⁴ 3-year average.TABLE 487.—*Eggs: Estimated average price per dozen, received by producers, United States, 1910–1929*

| Year beginning April— | Apr. 15 | May 15 | June 15 | July 15 | Aug. 15 | Sept. 15 | Oct. 15 | Nov. 15 | Dec. 15 | Jan. 15 | Feb. 15 | Mar. 15 | Weighted average |
|-----------------------|---------|--------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|------------------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1910..... | 18.6 | 18.4 | 18.2 | 17.9 | 18.5 | 20.9 | 23.8 | 27.2 | 29.7 | 26.2 | 19.2 | 15.7 | 19.3 |
| 1911..... | 14.8 | 14.6 | 14.4 | 14.8 | 16.4 | 18.7 | 21.8 | 26.1 | 29.1 | 29.3 | 26.8 | 21.2 | 18.2 |
| 1912..... | 17.4 | 16.9 | 16.7 | 17.0 | 18.2 | 20.6 | 24.0 | 27.8 | 28.2 | 24.8 | 21.1 | 17.9 | 18.9 |
| 1913..... | 15.9 | 16.5 | 16.8 | 16.4 | 17.7 | 21.3 | 26.0 | 31.3 | 32.9 | 29.8 | 25.3 | 22.2 | 19.8 |
| 1914..... | 16.4 | 16.9 | 17.2 | 17.5 | 19.1 | 22.5 | 23.7 | 28.2 | 31.9 | 31.7 | 23.7 | 16.5 | 19.3 |
| 1915..... | 16.6 | 16.5 | 16.1 | 16.3 | 17.3 | 20.6 | 24.6 | 29.4 | 31.1 | 28.8 | 24.2 | 18.2 | 19.0 |
| 1916..... | 17.7 | 18.5 | 18.9 | 19.9 | 21.6 | 25.3 | 30.4 | 34.9 | 38.3 | 38.1 | 35.7 | 25.3 | 23.3 |
| 1917..... | 28.5 | 30.2 | 29.9 | 29.0 | 30.5 | 35.8 | 38.5 | 41.2 | 45.9 | 48.9 | 45.8 | 30.9 | 33.0 |
| 1918..... | 30.4 | 30.6 | 29.5 | 33.0 | 35.2 | 39.1 | 44.9 | 51.7 | 59.3 | 54.5 | 34.8 | 33.9 | 34.9 |
| 1919..... | 36.0 | 38.9 | 36.1 | 37.9 | 40.6 | 43.1 | 51.0 | 59.1 | 69.6 | 60.9 | 48.5 | 40.5 | 41.8 |
| 1920..... | 36.6 | 37.5 | 35.9 | 37.8 | 42.5 | 48.6 | 54.6 | 62.9 | 67.1 | 54.5 | 31.0 | 26.8 | 39.3 |
| 1921..... | 20.5 | 19.4 | 20.1 | 24.3 | 28.9 | 30.9 | 39.4 | 50.0 | 51.1 | 31.7 | 31.4 | 19.5 | 25.3 |
| 1922..... | 20.0 | 20.9 | 20.2 | 20.3 | 20.6 | 27.3 | 34.6 | 43.6 | 47.2 | 37.8 | 29.9 | 25.4 | 24.7 |
| 1923..... | 21.6 | 21.8 | 20.9 | 21.3 | 23.6 | 29.8 | 34.6 | 45.6 | 45.5 | 35.4 | 33.6 | 20.4 | 25.2 |
| 1924..... | 19.1 | 19.8 | 21.1 | 22.8 | 26.1 | 31.8 | 38.2 | 45.8 | 49.9 | 48.6 | 35.7 | 23.9 | 26.1 |
| 1925..... | 24.2 | 24.8 | 26.1 | 27.9 | 30.0 | 31.1 | 37.7 | 46.8 | 48.1 | 36.3 | 28.9 | 24.1 | 28.3 |
| 1926..... | 24.8 | 25.2 | 25.7 | 25.7 | 26.4 | 31.5 | 36.8 | 44.9 | 47.6 | 36.9 | 29.0 | 20.8 | 27.5 |
| 1927..... | 20.3 | 19.8 | 17.8 | 20.7 | 23.4 | 29.4 | 35.6 | 41.6 | 43.3 | 38.2 | 29.1 | 23.4 | 24.2 |
| 1928..... | 22.8 | 24.2 | 23.9 | 25.6 | 27.4 | 31.4 | 34.9 | 39.6 | 42.9 | 33.0 | 31.9 | 28.0 | 27.4 |
| 1929..... | 23.0 | 24.4 | 26.1 | 27.2 | 29.8 | 33.9 | 38.4 | 44.2 | 45.8 | | | | |

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices weighted by production eggs, 1919 census, by States; yearly price obtained by weighting monthly prices by receipts monthly.

TABLE 488.—*Eggs: Average price per dozen at specified cities*

FRESH FIRSTS AT NEW YORK

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1910..... | 38 | 27 | 23 | 22 | 21 | 20 | 18 | 21 | 24 | 26 | 31 | 34 | 25 |
| 1911..... | 28 | 19 | 17 | 17 | 17 | 15 | 17 | 18 | 21 | 24 | 32 | 35 | 22 |
| 1912..... | 34 | 36 | 22 | 20 | 19 | 19 | 20 | 21 | 24 | 26 | 31 | 29 | 25 |
| 1913..... | 24 | 22 | 19 | 19 | 20 | 19 | 19 | 23 | 27 | 29 | 39 | 36 | 25 |
| 1914..... | 33 | 29 | 26 | 20 | 20 | 21 | 21 | 24 | 26 | 27 | 35 | 38 | 27 |
| 1915..... | 38 | 26 | 20 | 21 | 20 | 20 | 20 | 22 | 26 | 30 | 35 | 34 | 26 |
| 1916..... | 31 | 26 | 22 | 22 | 22 | 23 | 25 | 29 | 33 | 34 | 41 | 46 | 30 |
| 1917..... | 46 | 45 | 31 | 34 | 35 | 33 | 34 | 38 | 41 | 41 | 49 | 57 | 40 |
| 1918..... | 65 | 58 | 38 | 35 | 35 | 36 | 41 | 43 | 47 | 53 | 65 | 67 | 49 |
| 1919..... | 62 | 44 | 44 | 43 | 46 | 44 | 46 | 48 | 51 | 62 | 69 | 79 | 53 |
| 1920..... | 71 | 59 | 48 | 44 | 44 | 43 | 47 | 51 | 57 | 64 | 77 | 78 | 57 |
| 1921..... | 67 | 42 | 31 | 27 | 25 | 27 | 33 | 35 | 39 | 49 | 58 | 54 | 41 |
| 1922..... | 41 | 38 | 25 | 26 | 27 | 25 | 24 | 26 | 39 | 43 | 53 | 53 | 35 |
| 1923..... | 42 | 37 | 31 | 27 | 27 | 24 | 25 | 29 | 35 | 39 | 53 | 47 | 35 |
| 1924..... | 42 | 39 | 25 | 24 | 25 | 27 | 29 | 33 | 39 | 44 | 52 | 57 | 36 |
| 1925..... | 59 | 44 | 30 | 29 | 32 | 33 | 33 | 33 | 37 | 43 | 56 | 51 | 40 |
| 1926..... | 38 | 31 | 29 | 32 | 31 | 30 | 29 | 31 | 38 | 40 | 50 | 48 | 36 |
| 1927..... | 42 | 32 | 25 | 26 | 23 | 23 | 25 | 28 | 34 | 40 | 44 | 45 | 32 |
| 1928..... | 45 | 32 | 29 | 28 | 30 | 29 | 30 | 31 | 33 | 32 | 37 | 37 | 33 |
| 1929..... | 36 | 41 | 33 | 28 | 31 | 31 | 32 | 34 | 36 | 40 | 48 | 51 | 37 |

FRESH FIRSTS AT CHICAGO

| | | | | | | | | | | | | | |
|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1926..... | 36 | 29 | 27 | 29 | 29 | 28 | 27 | 29 | 36 | 40 | 48 | 44 | 34 |
| 1927..... | 38 | 27 | 24 | 23 | 22 | 22 | 23 | 26 | 33 | 37 | 42 | 43 | 30 |
| 1928..... | 43 | 29 | 27 | 27 | 28 | 28 | 28 | 30 | 32 | 34 | 41 | 39 | 32 |
| 1929..... | 36 | 38 | 29 | 26 | 30 | 29 | 31 | 33 | 37 | 42 | 47 | 48 | 35 |

WESTERN FIRSTS AT BOSTON

| | | | | | | | | | | | | | |
|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1926..... | 39 | 31 | 29 | 31 | 31 | 30 | 29 | 30 | 37 | 40 | 50 | 50 | 36 |
| 1927..... | 41 | 31 | 26 | 25 | 24 | 23 | 25 | 28 | 34 | 39 | 44 | 44 | 32 |
| 1928..... | 46 | 35 | 29 | 29 | 30 | 30 | 30 | 32 | 34 | 36 | 44 | 43 | 35 |
| 1929..... | 38 | 43 | 32 | 28 | 31 | 31 | 32 | 35 | 37 | 40 | 49 | 52 | 37 |

WESTERN EXTRA FIRSTS AT PHILADELPHIA

| | | | | | | | | | | | | | |
|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1926..... | 41 | 36 | 30 | 32 | 33 | 34 | 32 | 34 | 42 | 47 | 60 | 52 | 39 |
| 1927..... | 43 | 33 | 27 | 26 | 26 | 25 | 28 | 33 | 40 | 48 | 55 | 50 | 36 |
| 1928..... | 50 | 37 | 30 | 30 | 32 | 32 | 33 | 36 | 39 | 42 | 50 | 45 | 38 |
| 1929..... | 41 | 45 | 35 | 29 | 33 | 34 | 36 | 39 | 44 | 49 | 56 | 58 | 41 |

FRESH EXTRAS AT SAN FRANCISCO

| | | | | | | | | | | | | | |
|-------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1926 ¹ | 34 | 27 | 26 | 29 | 28 | 31 | 33 | 37 | 43 | 50 | 49 | 44 | 36 |
| 1927 ² | 33 | 25 | 23 | 24 | 24 | 24 | 26 | 32 | 39 | 47 | 44 | 38 | 32 |
| 1928..... | 33 | 24 | 25 | 25 | 26 | 29 | 30 | 33 | 39 | 44 | 45 | 38 | 33 |
| 1929..... | 31 | 26 | 25 | 26 | 31 | 32 | 37 | 41 | 44 | 52 | 49 | 44 | 36 |

Bureau of Agricultural Economics. Prices 1910-1922 are averages of daily prices in New York Journal of Commerce, Price Current and Chicago Dairy Produce, Philadelphia Commercial List; average of weekly prices quoted in Boston Chamber of Commerce and Pacific Dairy Review. Beginning 1923, monthly prices from the Bureau of Labor Statistics, except San Francisco, which is from the Pacific Dairy Review. Earlier data are available in 1925 Yearbook, p. 1224, Table 636, and 1927 Yearbook, p. 1105.

¹ Year 1926 are prices as quoted by the San Francisco Mercantile Exchange in the Pacific Dairy Review not subject to discount.

² Beginning January, 1927, prices furnished by the Bureau of Agricultural Economics to the Pacific Dairy Review, for United States No. 1 extras.

TABLE 489.—*Chickens: Estimated number and value on hand January 1, 1920–1929*

| Geographic division and year | Chickens on hand Jan. 1 | | | Geographic division and year | Chickens on hand Jan. 1 | | |
|---------------------------------|-------------------------|----------------------|--------------------------|---------------------------------|-------------------------|----------------------|--------------------------|
| | Number of fowls | Price per fowl | Total value | | Number of fowls | Price per fowl | Total value |
| | <i>Thou- sands</i> | <i>Cents</i> | <i>1,000 dollars</i> | | <i>Thou- sands</i> | <i>Cents</i> | <i>1,000 dollars</i> |
| North Atlantic: | | | | South Atlantic—Con. | | | |
| 1920 (census)..... | 33,256 | 138.28 | 45,988 | 1925..... | 42,271 | 81.95 | 34,641 |
| 1921..... | 33,588 | 133.72 | 44,914 | 1926..... | 42,095 | 88.10 | 37,065 |
| 1922..... | 39,906 | 117.12 | 46,738 | 1927..... | 45,023 | 89.02 | 40,081 |
| 1923..... | 42,899 | 112.56 | 48,287 | 1928..... | 47,722 | 84.50 | 40,323 |
| 1924..... | 46,586 | 116.09 | 54,080 | 1929..... | 42,583 | 86.96 | 37,030 |
| 1925..... | 44,077 | 118.16 | 52,046 | South Central: | | | |
| 1926..... | 44,817 | 126.45 | 56,669 | 1920 (census)..... | 74,011 | 84.82 | 62,777 |
| 1927..... | 46,164 | 125.12 | 57,760 | 1921..... | 70,275 | 75.32 | 52,931 |
| 1928..... | 47,711 | 122.80 | 58,587 | 1922..... | 80,631 | 66.24 | 53,410 |
| 1929..... | 46,240 | 129.27 | 59,776 | 1923..... | 76,193 | 61.58 | 46,920 |
| East North Central: | | | | 1924..... | 88,492 | 61.77 | 54,662 |
| 1920 (census)..... | 84,516 | 96.02 | 81,154 | 1925..... | 81,086 | 65.26 | 52,916 |
| 1921..... | 80,260 | 88.05 | 70,669 | 1926..... | 81,155 | 71.29 | 57,858 |
| 1922..... | 88,709 | 79.12 | 70,187 | 1927..... | 99,125 | 67.18 | 66,592 |
| 1923..... | 95,467 | 73.36 | 70,035 | 1928..... | 93,801 | 70.45 | 66,085 |
| 1924..... | 98,949 | 79.02 | 78,190 | 1929..... | 87,434 | 73.38 | 64,161 |
| 1925..... | 91,289 | 85.33 | 77,901 | Far Western: | | | |
| 1926..... | 93,932 | 95.42 | 89,628 | 1920 (census)..... | 25,999 | 115.41 | 30,005 |
| 1927..... | 98,775 | 90.30 | 95,125 | 1921..... | 25,994 | 108.95 | 28,320 |
| 1928..... | 90,129 | 90.83 | 90,037 | 1922..... | 31,973 | 100.29 | 32,066 |
| 1929..... | 96,634 | 98.36 | 95,054 | 1923..... | 34,572 | 88.75 | 30,683 |
| West North Central: | | | | 1924..... | 36,842 | 81.65 | 30,081 |
| 1920 (census)..... | 105,348 | 89.51 | 94,293 | 1925..... | 34,557 | 81.73 | 28,244 |
| 1921..... | 108,559 | 81.45 | 88,421 | 1926..... | 36,035 | 93.38 | 33,648 |
| 1922..... | 114,883 | 75.81 | 87,093 | 1927..... | 39,331 | 100.94 | 39,700 |
| 1923..... | 121,206 | 64.89 | 78,651 | 1928..... | 41,873 | 90.85 | 38,042 |
| 1924..... | 132,587 | 66.37 | 87,995 | 1929..... | 39,147 | 93.09 | 36,440 |
| 1925..... | 124,475 | 68.39 | 85,123 | United States: | | | |
| 1926..... | 126,193 | 80.05 | 101,012 | 1920 (census)..... | 359,537 | 97.21 | 349,509 |
| 1927..... | 129,947 | 83.94 | 109,076 | 1921..... | 356,168 | 89.30 | 318,058 |
| 1928..... | 130,628 | 79.14 | 103,377 | 1922..... | 396,507 | 80.77 | 320,259 |
| 1929..... | 129,693 | 86.53 | 112,229 | 1923..... | 411,469 | 74.61 | 306,998 |
| South Atlantic: | | | | 1924..... | 449,188 | 76.09 | 341,765 |
| 1920 (census)..... | 36,408 | 96.94 | 35,292 | 1925..... | 417,755 | 79.20 | 330,871 |
| 1921..... | 37,492 | 86.96 | 32,603 | 1926..... | 424,227 | 88.61 | 375,900 |
| 1922..... | 40,405 | 75.61 | 30,550 | 1927..... | 448,365 | 91.07 | 408,334 |
| 1923..... | 41,132 | 77.55 | 31,898 | 1928..... | 460,864 | 86.02 | 396,451 |
| 1924..... | 45,732 | 80.37 | 36,757 | 1929..... | 441,731 | 91.61 | 404,690 |

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TABLE 490.—*Chickens: Estimated number and value on farms, January 1, 1924-1929*

| State and division | Number chickens Jan. 1 | | | | | | Value per head | | | | | | Total value | | | | | |
|---------------------------------|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------|--------|--------|--------|--------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Thou- sands | Cents | Cents | Cents | Cents | Cents | Cents | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Maine | 2,197 | 1,857 | 1,868 | 2,020 | 1,905 | 1,905 | 125 | 125 | 132 | 132 | 138 | 140 | 2,404 | 2,446 | 2,583 | 2,503 | 2,747 | 2,571 |
| New Hampshire | 1,293 | 1,267 | 1,262 | 1,212 | 1,338 | 1,271 | 145 | 140 | 148 | 153 | 150 | 150 | 1,879 | 1,774 | 1,875 | 1,900 | 2,004 | 1,908 |
| Vermont | 1,054 | 970 | 999 | 1,040 | 978 | 1,222 | 122 | 122 | 130 | 132 | 130 | 130 | 1,251 | 1,251 | 1,352 | 1,319 | 1,352 | 1,271 |
| Massachusetts | 2,071 | 2,030 | 2,030 | 1,949 | 2,027 | 1,991 | 160 | 150 | 165 | 155 | 160 | 160 | 3,314 | 3,045 | 3,359 | 3,021 | 3,243 | 3,196 |
| Rhode Island | 351 | 361 | 351 | 353 | 412 | 391 | 165 | 160 | 170 | 160 | 160 | 157 | 596 | 578 | 614 | 613 | 659 | 614 |
| Connecticut | 1,752 | 1,699 | 1,734 | 1,820 | 1,961 | 2,059 | 145 | 145 | 155 | 150 | 155 | 155 | 2,540 | 2,464 | 2,755 | 2,730 | 3,040 | 3,191 |
| New York | 14,835 | 13,945 | 13,945 | 14,224 | 14,368 | 13,980 | 114 | 112 | 121 | 120 | 117 | 123 | 16,912 | 15,618 | 16,573 | 17,069 | 16,808 | 17,195 |
| New Jersey | 4,512 | 4,196 | 4,322 | 4,538 | 4,674 | 4,628 | 140 | 140 | 149 | 146 | 130 | 145 | 6,317 | 5,874 | 6,400 | 6,025 | 6,075 | 6,711 |
| Pennsylvania | 18,581 | 17,532 | 18,181 | 19,111 | 19,875 | 19,034 | 100 | 106 | 115 | 115 | 114 | 121 | 18,581 | 19,064 | 20,408 | 21,978 | 22,658 | 23,031 |
| North Atlantic | 46,556 | 44,077 | 41,817 | 46,164 | 47,711 | 46,240 | 116.09 | 118.16 | 126.45 | 125.12 | 122.80 | 129.27 | 54,080 | 52,046 | 56,609 | 57,760 | 58,557 | 59,776 |
| Ohio | 22,707 | 21,345 | 22,043 | 23,519 | 22,837 | 23,185 | 85 | 89 | 100 | 100 | 88 | 97 | 19,301 | 18,997 | 22,643 | 23,519 | 22,215 | 22,489 |
| Indiana | 19,452 | 17,710 | 17,956 | 18,310 | 17,331 | 17,331 | 75 | 82 | 94 | 95 | 89 | 95 | 14,596 | 14,522 | 16,315 | 17,394 | 15,861 | 16,464 |
| Illinois | 28,866 | 25,995 | 26,514 | 27,575 | 27,479 | 27,148 | 90 | 85 | 96 | 96 | 91 | 101 | 22,853 | 22,096 | 25,453 | 26,472 | 25,066 | 27,419 |
| Michigan | 14,083 | 12,956 | 13,605 | 14,422 | 15,143 | 14,503 | 81 | 90 | 98 | 98 | 92 | 103 | 11,407 | 11,660 | 13,061 | 14,134 | 13,932 | 14,938 |
| Wisconsin | 14,131 | 13,283 | 13,814 | 14,919 | 14,799 | 14,467 | 71 | 80 | 88 | 91 | 88 | 95 | 10,083 | 10,626 | 12,156 | 13,576 | 13,023 | 13,744 |
| East North Central | 98,949 | 91,289 | 93,032 | 98,775 | 99,129 | 96,634 | 79.02 | 85.33 | 95.42 | 96.30 | 90.83 | 98.35 | 78,190 | 77,901 | 89,628 | 95,125 | 90,037 | 95,054 |
| Minnesota | 17,433 | 16,736 | 17,087 | 17,276 | 16,789 | 17,411 | 60 | 70 | 77 | 80 | 73 | 79 | 10,460 | 11,715 | 13,157 | 13,821 | 12,256 | 13,755 |
| Iowa | 32,554 | 30,375 | 31,183 | 31,806 | 32,310 | 32,005 | 73 | 78 | 89 | 90 | 84 | 90 | 23,764 | 23,614 | 27,153 | 28,625 | 27,166 | 28,804 |
| Missouri | 31,984 | 28,736 | 29,387 | 31,723 | 31,733 | 30,603 | 72 | 70 | 81 | 85 | 85 | 85 | 20,028 | 20,150 | 24,219 | 26,073 | 26,973 | 29,073 |
| North Dakota | 5,508 | 5,233 | 5,442 | 5,263 | 5,138 | 5,322 | 54 | 58 | 70 | 71 | 70 | 77 | 2,974 | 3,035 | 3,809 | 3,737 | 3,611 | 4,098 |
| South Dakota | 8,405 | 7,985 | 8,065 | 8,226 | 8,449 | 8,472 | 62 | 62 | 73 | 82 | 74 | 83 | 3,453 | 4,951 | 5,887 | 6,357 | 6,252 | 7,032 |
| Nebraska | 14,203 | 13,635 | 13,660 | 13,613 | 13,787 | 13,471 | 62 | 58 | 74 | 80 | 75 | 81 | 8,996 | 8,996 | 9,687 | 10,890 | 10,340 | 11,316 |
| Kansas | 27,500 | 21,825 | 21,389 | 22,080 | 22,372 | 22,409 | 69 | 65 | 71 | 83 | 75 | 81 | 13,500 | 13,750 | 16,470 | 18,265 | 16,779 | 18,151 |
| West North Central | 132,557 | 124,475 | 126,193 | 129,947 | 130,628 | 129,693 | 66.37 | 68.39 | 80.05 | 83.94 | 79.14 | 86.53 | 87,985 | 85,123 | 101,912 | 109,076 | 108,377 | 112,229 |
| North Central | 291,536 | 215,764 | 220,125 | 228,722 | 229,757 | 226,327 | 71.78 | 75.56 | 86.61 | 89.28 | 84.18 | 91.59 | 105,185 | 103,024 | 190,640 | 204,204 | 201,193 | 214,207 |

| | | | | | | | | | | | | | | | | | | |
|---------------------|---------|---------|---------|---------|---------|---------|-------|-------|-------|--------|-------|-------|---------|---------|---------|---------|---------|---------|
| Delaware..... | 1,547 | 1,392 | 1,392 | 1,424 | 1,462 | 1,389 | 100 | 100 | 115 | 120 | 105 | 109 | 1,547 | 1,392 | 1,601 | 1,721 | 1,535 | 1,514 |
| Maryland..... | 4,504 | 4,324 | 4,454 | 4,721 | 4,762 | 4,511 | 93 | 95 | 113 | 112 | 100 | 104 | 4,468 | 4,105 | 4,683 | 5,268 | 4,762 | 4,661 |
| Virginia..... | 10,431 | 9,406 | 9,504 | 10,311 | 10,366 | 9,879 | 83 | 90 | 92 | 91 | 90 | 95 | 8,674 | 8,007 | 8,635 | 9,532 | 9,915 | 9,385 |
| West Virginia..... | 4,928 | 4,430 | 4,436 | 4,549 | 4,741 | 4,643 | 82 | 83 | 95 | 92 | 90 | 92 | 4,042 | 3,682 | 4,124 | 4,203 | 4,272 | 4,272 |
| North Carolina..... | 9,570 | 8,900 | 8,940 | 9,315 | 10,116 | 8,673 | 77 | 78 | 80 | 81 | 81 | 82 | 7,969 | 7,120 | 7,569 | 7,660 | 8,194 | 7,114 |
| South Carolina..... | 4,644 | 4,365 | 4,103 | 4,513 | 4,527 | 4,138 | 73 | 73 | 73 | 73 | 73 | 72 | 3,390 | 3,186 | 3,520 | 3,520 | 3,524 | 2,979 |
| Georgia..... | 7,478 | 7,254 | 7,066 | 7,032 | 8,215 | 7,054 | 70 | 75 | 74 | 76 | 71 | 72 | 5,235 | 5,440 | 5,229 | 5,900 | 5,854 | 5,070 |
| Florida..... | 2,309 | 2,194 | 2,150 | 2,445 | 2,667 | 2,294 | 85 | 95 | 105 | 100 | 85 | 87 | 2,032 | 2,084 | 2,238 | 2,448 | 2,267 | 1,996 |
| South Atlantic..... | 45,732 | 42,271 | 42,065 | 45,023 | 47,722 | 42,363 | 50.37 | 81.95 | 88.10 | 89.02 | 84.50 | 86.96 | 36,757 | 34,641 | 37,085 | 40,081 | 40,323 | 37,030 |
| Kentucky..... | 12,508 | 11,257 | 11,483 | 12,401 | 12,539 | 11,063 | 65 | 69 | 74 | 90 | 77 | 82 | 8,130 | 7,767 | 8,497 | 9,921 | 9,655 | 9,072 |
| Tennessee..... | 13,425 | 12,217 | 12,584 | 13,339 | 14,155 | 12,712 | 63 | 68 | 73 | 77 | 73 | 75 | 8,458 | 8,308 | 9,196 | 10,271 | 10,334 | 9,534 |
| Alabama..... | 7,192 | 6,473 | 6,473 | 6,802 | 7,090 | 6,237 | 65 | 65 | 67 | 70 | 67 | 70 | 4,675 | 4,207 | 4,337 | 4,903 | 4,750 | 4,366 |
| Mississippi..... | 6,817 | 6,135 | 6,403 | 7,023 | 7,171 | 6,584 | 69 | 70 | 70 | 71 | 70 | 72 | 4,294 | 4,294 | 4,552 | 4,946 | 5,020 | 4,740 |
| Arkansas..... | 8,548 | 7,522 | 7,898 | 8,530 | 8,571 | 8,401 | 58 | 58 | 67 | 67 | 62 | 68 | 4,958 | 4,363 | 5,292 | 5,715 | 5,500 | 5,713 |
| Louisiana..... | 4,514 | 4,063 | 4,063 | 4,724 | 4,289 | 4,307 | 76 | 67 | 77 | 76 | 77 | 81 | 3,431 | 2,722 | 3,129 | 3,560 | 3,303 | 3,489 |
| Oklahoma..... | 13,836 | 13,293 | 13,626 | 15,107 | 15,501 | 15,457 | 53 | 63 | 74 | 80 | 73 | 78 | 7,748 | 8,368 | 10,083 | 12,086 | 11,360 | 12,056 |
| Texas..... | 21,652 | 20,136 | 18,525 | 21,139 | 24,124 | 22,673 | 58 | 64 | 69 | 72 | 67 | 67 | 12,558 | 12,887 | 12,782 | 15,290 | 16,163 | 15,191 |
| South Central..... | 88,492 | 81,066 | 81,155 | 99,125 | 93,801 | 87,434 | 61.77 | 65.26 | 71.29 | 67.18 | 70.45 | 73.38 | 54,662 | 52,916 | 57,838 | 66,592 | 66,085 | 64,161 |
| Montana..... | 2,707 | 2,545 | 2,596 | 2,406 | 2,676 | 2,863 | 62 | 70 | 71 | 80 | 83 | 84 | 1,734 | 1,732 | 1,843 | 1,973 | 2,221 | 2,405 |
| Idaho..... | 2,200 | 2,090 | 2,104 | 2,414 | 2,502 | 2,728 | 56 | 61 | 70 | 75 | 73 | 79 | 1,232 | 1,275 | 1,536 | 1,810 | 1,870 | 2,155 |
| Wyoming..... | 899 | 809 | 793 | 833 | 933 | 930 | 62 | 70 | 73 | 80 | 90 | 82 | 557 | 556 | 579 | 662 | 762 | 763 |
| Colorado..... | 4,078 | 3,752 | 3,902 | 4,214 | 4,288 | 4,502 | 66 | 67 | 73 | 78 | 74 | 75 | 2,691 | 2,514 | 2,848 | 3,287 | 3,173 | 3,376 |
| New Mexico..... | 1,072 | 965 | 883 | 977 | 1,119 | 1,101 | 67 | 68 | 75 | 81 | 74 | 76 | 718 | 656 | 696 | 791 | 828 | 837 |
| Arizona..... | 565 | 655 | 720 | 864 | 735 | 676 | 88 | 90 | 100 | 95 | 95 | 100 | 524 | 590 | 720 | 821 | 698 | 676 |
| Utah..... | 1,436 | 1,436 | 1,405 | 1,642 | 1,506 | 1,700 | 68 | 66 | 76 | 73 | 75 | 81 | 976 | 948 | 1,068 | 1,232 | 1,354 | 1,377 |
| Nevada..... | 260 | 234 | 251 | 271 | 288 | 286 | 90 | 77 | 90 | 90 | 95 | 100 | 234 | 180 | 226 | 244 | 274 | 286 |
| Washington..... | 5,691 | 5,377 | 6,134 | 7,054 | 7,513 | 6,802 | 82 | 80 | 95 | 105 | 90 | 95 | 4,467 | 4,402 | 5,827 | 7,407 | 6,762 | 6,450 |
| Oregon..... | 3,501 | 3,326 | 3,326 | 3,392 | 3,591 | 3,729 | 90 | 93 | 94 | 95 | 91 | 95 | 3,151 | 2,731 | 3,126 | 3,222 | 3,268 | 3,542 |
| California..... | 14,313 | 13,168 | 13,836 | 15,206 | 16,342 | 13,770 | 95 | 95 | 110 | 120 | 103 | 109 | 13,597 | 12,510 | 15,209 | 18,251 | 16,832 | 14,573 |
| Far Western..... | 36,842 | 34,557 | 36,085 | 39,331 | 41,873 | 39,147 | 81.65 | 81.73 | 93.39 | 100.94 | 90.85 | 93.09 | 30,081 | 28,244 | 33,645 | 39,700 | 38,042 | 36,440 |
| United States..... | 449,198 | 417,755 | 424,227 | 448,363 | 460,864 | 441,781 | 76.09 | 79.20 | 88.61 | 91.07 | 86.02 | 91.61 | 341,765 | 330,871 | 373,900 | 438,334 | 436,451 | 400,690 |

Bureau of Agricultural Economics.

FOREIGN TRADE OF THE UNITED STATES IN AGRICULTURAL PRODUCTS

TABLE 491.—Summary of exports and imports, United States, 1909-1929

| Year ended June 30— | Total exports | Agricultural exports ¹ | | | Total imports | Agricultural imports ¹ | Percent- age of total | Excess of agricultural exports | Forest products | | | |
|------------------------|---------------|-----------------------------------|----------|-----------|---------------|-----------------------------------|-----------------------------|--------------------------------------|-----------------|-----------|---------|----------------------|
| | | Domestic | | Reexports | | | | | Exports | | Imports | Excess of imports |
| | | 1,000 dollars | Per cent | | | | | | Domestic | Reexports | | |
| | | | | | | | | | | | | |
| 1909..... | 1,638,356 | 903,238 | 55.1 | 12,779 | 1,311,920 | 701,780 | 53.5 | 214,237 | 72,442 | 1,789 | 60,753 | 13,478 |
| 1910..... | 1,710,084 | 871,158 | 50.9 | 22,162 | 1,556,947 | 791,372 | 50.8 | 101,948 | 85,060 | 2,110 | 75,009 | 12,131 |
| 1911..... | 2,013,549 | 1,030,794 | 51.2 | 20,573 | 1,527,226 | 770,781 | 50.5 | 280,586 | 103,039 | 1,679 | 71,736 | 32,982 |
| 1912..... | 2,170,320 | 1,050,027 | 48.4 | 17,171 | 1,653,265 | 886,399 | 53.6 | 181,399 | 108,122 | 1,350 | 69,581 | 39,891 |
| 1913..... | 2,428,506 | 1,123,652 | 46.3 | 19,632 | 1,813,008 | 912,925 | 50.4 | 230,379 | 124,836 | 2,809 | 82,878 | 44,767 |
| 1914..... | 2,320,684 | 1,113,974 | 47.8 | 20,286 | 1,893,026 | 998,346 | 52.7 | 135,914 | 106,979 | 1,961 | 81,162 | 27,778 |
| 1915..... | 2,716,178 | 1,475,938 | 54.3 | 38,222 | 1,674,170 | 997,184 | 59.6 | 510,978 | 122,554 | 1,287 | 79,451 | 25,610 |
| 1916..... | 4,272,178 | 1,518,071 | 35.5 | 45,017 | 2,937,884 | 1,348,291 | 46.3 | 214,797 | 68,155 | 1,435 | 94,265 | 24,675 |
| 1917..... | 6,227,164 | 1,968,253 | 31.6 | 45,420 | 2,659,355 | 1,598,091 | 60.1 | 415,582 | 68,919 | 3,392 | 129,580 | 57,269 |
| 1918..... | 5,838,652 | 2,280,466 | 39.1 | 44,210 | 2,945,655 | 1,825,417 | 62.0 | 499,259 | 87,181 | 1,409 | 128,490 | 39,900 |
| 1919..... | 7,081,462 | 3,579,918 | 50.6 | 105,587 | 3,065,730 | 1,929,384 | 62.3 | 1,756,121 | 113,275 | 3,758 | 132,588 | 15,555 |
| 1920..... | 7,949,309 | 3,861,511 | 48.6 | 128,191 | 3,238,352 | 2,059,977 | 63.4 | 590,725 | 190,049 | 5,380 | 229,092 | 33,663 |
| 1921..... | 6,385,884 | 2,607,641 | 40.8 | 90,740 | 3,654,459 | 2,059,816 | 56.4 | 638,565 | 141,876 | 4,043 | 225,162 | 79,243 |
| 1922..... | 3,698,909 | 1,915,866 | 51.8 | 43,587 | 2,008,079 | 1,371,510 | 68.3 | 587,943 | 94,115 | 2,316 | 156,844 | 60,413 |
| 1923..... | 3,896,682 | 1,799,168 | 46.3 | 48,393 | 3,780,959 | 2,076,371 | 54.9 | 228,810 | 129,981 | 1,945 | 234,599 | 102,673 |
| 1924..... | 4,223,973 | 1,867,058 | 44.2 | 62,719 | 3,554,037 | 1,874,622 | 52.7 | 55,195 | 162,374 | 1,563 | 216,711 | 52,774 |
| 1925..... | 4,778,155 | 2,280,381 | 47.7 | 64,168 | 3,524,128 | 2,096,619 | 59.8 | 287,930 | 156,187 | 1,291 | 227,423 | 69,945 |
| 1926..... | 4,653,148 | 1,891,739 | 40.7 | 75,162 | 4,464,872 | 2,528,213 | 56.6 | 561,312 | 162,731 | 1,450 | 238,545 | 74,364 |
| 1927..... | 4,867,346 | 1,907,864 | 39.2 | 72,169 | 4,252,024 | 2,280,340 | 53.6 | 300,307 | 171,970 | 1,365 | 238,247 | 64,912 |
| 1928..... | 4,773,332 | 1,815,451 | 38.0 | 73,391 | 4,147,499 | 2,193,091 | 52.9 | 304,249 | 174,599 | 1,528 | 215,874 | 39,747 |
| 1929, preliminary..... | 5,284,144 | 1,847,567 | 35.0 | 63,942 | 4,291,866 | 2,178,470 | 50.8 | 266,961 | 180,893 | 2,157 | 222,259 | 39,209 |

Bureau of Agricultural Economics. This table supercedes Table No. 472 in the Yearbook of Agriculture, 1927; the value of total imports and exports has been given and the imports of "rubber and similar gums" have been deducted from "imports of forest products" and added to "reexports of agricultural." Also reexports of "rubber and similar gums" have been deducted from "reexports of forest products" and added to "reexports of agricultural."

¹ Does not include forest products.

¹ Excess of agricultural imports.

¹ Excess of exports

FOREIGN TRADE IN AGRICULTURAL PRODUCTS

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TABLE 492.—*Agricultural products: Value of principal groups exported from and imported into the United States, 1927-1929*

| Article | Year ended June 30 | | | | | |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Domestic exports | | | Imports | | |
| | 1927 | 1928 | 1929 preliminary | 1927 | 1928 | 1929 preliminary |
| ANIMALS AND ANIMAL PRODUCTS | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> |
| Animals, live..... | 5,949 | 6,700 | 6,058 | 17,630 | 20,198 | 29,634 |
| Dairy products..... | 17,523 | 17,043 | 17,668 | 42,100 | 37,748 | 37,764 |
| Eggs and egg products..... | 7,901 | 6,534 | 5,145 | 7,592 | 3,710 | 8,130 |
| Hides and skins, raw (except fur)..... | 11,754 | 11,243 | 9,112 | 95,052 | 146,423 | 131,781 |
| Meats and meat products..... | 203,431 | 178,782 | 187,871 | 17,636 | 23,044 | 30,654 |
| Silk, unmanufactured..... | | | | 421,393 | 382,469 | 393,648 |
| Wool and mohair, unmanufactured..... | 146 | 172 | 107 | 83,683 | 79,443 | 86,520 |
| Animal products, miscellaneous..... | 13,927 | 13,608 | 13,890 | 38,090 | 37,739 | 40,863 |
| Total animals and animal products..... | 260,631 | 234,082 | 239,851 | 723,176 | 736,774 | 758,994 |
| VEGETABLE PRODUCTS | | | | | | |
| Chocolate and cocoa..... | 596 | 596 | 606 | 52,268 | 57,398 | 45,771 |
| Coffee..... | 7,863 | 4,540 | 2,625 | 293,420 | 297,852 | 308,268 |
| Cotton lint, unmanufactured..... | 860,079 | 813,401 | 861,008 | 37,206 | 44,803 | 56,437 |
| Linters..... | 6,845 | 7,136 | 7,120 | | | |
| Total cotton, unmanufactured..... | 866,924 | 820,537 | 868,218 | 37,206 | 44,803 | 56,437 |
| Fruits..... | 128,053 | 112,129 | 149,347 | 54,141 | 56,414 | 56,504 |
| Grains and grain products..... | 406,382 | 404,041 | 335,438 | 28,480 | 34,616 | 37,026 |
| Nuts..... | 1,667 | 1,524 | 1,528 | 33,079 | 29,472 | 31,198 |
| Oilseeds and oilseed products..... | 40,882 | 42,116 | 40,703 | 158,163 | 143,862 | 188,277 |
| Rubber and similar gums..... | | | | 374,907 | 312,300 | 235,075 |
| Seeds, except oilseeds..... | 3,714 | 3,498 | 2,854 | 10,351 | 8,516 | 9,843 |
| Spices..... | 220 | 248 | 295 | 18,906 | 19,019 | 18,311 |
| Sugar, molasses, and sirups..... | 10,367 | 9,527 | 9,951 | 265,285 | 245,719 | 227,825 |
| Tea..... | | | | 30,959 | 29,006 | 26,968 |
| Tobacco, unmanufactured..... | 136,075 | 135,970 | 148,115 | 76,672 | 58,804 | 55,803 |
| Vegetables..... | 20,324 | 21,255 | 23,333 | 38,709 | 39,196 | 39,674 |
| Vegetable products, miscellaneous..... | 24,166 | 25,525 | 24,703 | 84,609 | 79,340 | 82,291 |
| Total vegetable products..... | 1,647,233 | 1,581,369 | 1,607,716 | 1,557,164 | 1,456,317 | 1,419,476 |
| Total animal and vegetable products..... | 1,907,864 | 1,815,451 | 1,847,567 | 2,280,340 | 2,193,091 | 2,178,470 |
| FOREST PRODUCTS | | | | | | |
| Dyeing and tanning materials..... | 1,939 | 2,716 | 2,414 | 8,967 | 9,728 | 8,020 |
| Gums, resins, and balsams..... | 38,279 | 29,685 | 28,701 | 31,878 | 31,595 | 35,977 |
| Wood..... | 125,955 | 136,685 | 141,417 | 103,613 | 87,531 | 86,211 |
| Forest products, miscellaneous..... | 5,797 | 5,514 | 8,361 | 93,789 | 87,020 | 92,051 |
| Total forest products..... | 171,970 | 174,599 | 180,893 | 238,247 | 215,874 | 222,259 |
| Total agricultural products..... | 2,079,834 | 1,990,050 | 2,028,460 | 2,518,587 | 2,408,965 | 2,400,729 |

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1927 and 1928.

In the statistics of foreign commerce of the United States, the Philippine Islands are treated as a foreign country.

The statistics of foreign commerce include the trade of the customs districts of Alaska, Hawaii, and Porto Rico with foreign countries, but do not include the trade of these Territories with the United States.

TABLE 493.—*Agricultural products: Value of trade between Continental United States and noncontiguous Territories, 1922-1929*

| Year ended June 30— | Porto Rico | | Hawaii | | Alaska | |
|------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Shipments to | Shipments from | Shipments to | Shipments from | Shipments to | Shipments from |
| | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> |
| 1922..... | 21,926 | 53,892 | 12,734 | 66,292 | 7,123 | 13 |
| 1923..... | 24,080 | 61,801 | 15,976 | 93,313 | 8,297 | 190 |
| 1924..... | 28,819 | 66,581 | 17,539 | 104,267 | 9,016 | 365 |
| 1925..... | 29,710 | 70,190 | 17,954 | 97,430 | 9,774 | 415 |
| 1926..... | 32,212 | 70,385 | 17,806 | 105,470 | 9,539 | 516 |
| 1927..... | 32,603 | 84,061 | 18,019 | 98,600 | 8,737 | 592 |
| 1928..... | 28,146 | 82,326 | 19,005 | 110,338 | 9,435 | 175 |
| 1929, preliminary..... | 31,468 | 53,328 | 19,335 | 103,653 | 9,108 | 137 |

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1923-1929.

TABLE 494.—*Index numbers of United States agricultural exports, 1910-1929*

[Base 1910-1914 = 100]

| Year ended June 30— | All com- modities | All com- modities except cotton | Cotton fiber | Grains and products | Cattle and meat products | Dairy products | Fruits |
|---------------------|----------------------|--|-----------------|---------------------------|--------------------------------|-------------------|--------|
| 1910..... | 78 | 86 | 73 | 82 | 91 | 58 | 76 |
| 1911..... | 92 | 92 | 91 | 85 | 104 | 93 | 89 |
| 1912..... | 114 | 100 | 125 | 78 | 115 | 126 | 101 |
| 1913..... | 110 | 119 | 103 | 143 | 97 | 120 | 136 |
| 1914..... | 106 | 103 | 108 | 112 | 92 | 103 | 98 |
| 1915..... | 138 | 189 | 99 | 301 | 126 | 302 | 119 |
| 1916..... | 118 | 184 | 70 | 237 | 164 | 479 | 109 |
| 1917..... | 118 | 182 | 70 | 217 | 164 | 716 | 101 |
| 1918..... | 101 | 165 | 53 | 179 | 197 | 975 | 63 |
| 1919..... | 145 | 255 | 63 | 272 | 287 | 1,287 | 111 |
| 1920..... | 134 | 207 | 80 | 218 | 185 | 1,275 | 122 |
| 1921..... | 127 | 212 | 64 | 329 | 154 | 524 | 108 |
| 1922..... | 137 | 218 | 76 | 317 | 153 | 571 | 105 |
| 1923..... | 112 | 182 | 59 | 246 | 169 | 406 | 121 |
| 1924..... | 104 | 153 | 67 | 143 | 179 | 451 | 214 |
| 1925..... | 126 | 167 | 95 | 225 | 140 | 396 | 184 |
| 1926..... | 106 | 123 | 93 | 117 | 114 | 327 | 211 |
| 1927..... | 136 | 143 | 131 | 188 | 98 | 288 | 301 |
| 1928..... | 112 | 138 | 92 | 188 | 98 | 263 | 258 |
| 1929..... | 117 | 141 | 99 | 174 | 102 | 243 | 372 |

Bureau of Agricultural Economics.

TABLE 495.—*Exports and imports of selected forest products, 1909-1929*

| Year ended June 30— | Domestic exports | | | | | Imports | | | | |
|------------------------|------------------------------------|----------------|------------------|------------------------------------|--------------------------------------|------------------------|---|---------------|-----------------|------------------|
| | Lumber | | Rosin | Spirits of tur- pen- tine | Tim- ber, hewn and sawed | Cam- phor, crude | Lumber | | Shellac | Wood pulp |
| | Boards, deals, and planks | Staves | | | | | Boards, deals, planks, and other sawed | Shin- gles | | |
| | 1,000 M feet | Thou- sands | 1,000 barrels | 1,000 gallons | 1,000 M feet | 1,000 pounds | 1,000 M feet | 1,000 M | 1,000 pounds | 1,000 L. tons |
| 1909..... | 1,358 | 52,583 | 2,170 | 17,502 | 419 | 1,990 | 846 | 1,058 | 19,185 | 274 |
| 1910..... | 1,684 | 49,784 | 2,144 | 15,588 | 491 | 3,007 | 1,054 | 763 | 29,402 | 378 |
| 1911..... | 2,032 | 65,726 | 2,190 | 14,818 | 532 | 3,726 | 872 | 643 | 15,495 | 492 |
| 1912..... | 2,307 | 64,163 | 2,474 | 19,590 | 438 | 2,155 | 905 | 515 | 18,746 | 478 |
| 1913..... | 2,550 | 89,006 | 2,806 | 21,094 | 512 | 3,709 | 1,091 | 560 | 21,912 | 502 |
| 1914..... | 2,405 | 77,151 | 2,418 | 18,901 | 441 | 3,477 | 929 | 896 | 16,720 | 508 |
| 1915..... | 1,129 | 39,207 | 1,372 | 9,464 | 174 | 3,729 | 939 | 1,487 | 24,153 | 588 |
| 1916..... | 1,177 | 57,538 | 1,571 | 9,310 | 201 | 4,574 | 1,218 | 1,769 | 25,818 | 507 |
| 1917..... | 1,042 | 61,469 | 1,639 | 8,842 | 184 | 6,885 | 1,175 | 1,924 | 32,540 | 699 |
| 1918..... | 1,068 | 63,207 | 1,071 | 5,095 | 106 | 3,638 | 1,283 | 1,878 | 22,913 | 504 |
| 1919..... | 1,073 | 62,753 | 882 | 8,065 | 92 | 2,623 | 977 | 1,757 | 14,209 | 475 |
| 1920..... | 1,518 | 80,791 | 1,322 | 7,461 | 234 | 4,026 | 1,492 | 2,152 | 34,151 | 727 |
| 1921..... | 1,269 | 65,710 | 877 | 9,742 | 123 | 2,093 | 920 | 1,831 | 23,872 | 624 |
| 1922..... | 1,543 | 35,162 | 786 | 10,786 | 268 | 1,502 | 1,124 | 2,190 | 30,768 | 902 |
| 1923..... | 1,549 | 57,466 | 1,040 | 9,012 | 383 | 3,498 | 1,958 | 2,695 | 32,773 | 1,293 |
| 1924..... | 1,867 | 60,868 | 1,205 | 11,194 | 815 | 1,955 | 1,786 | 2,417 | 28,512 | 1,188 |
| 1925..... | 1,929 | 79,922 | 1,412 | 12,308 | 586 | 1,904 | 1,732 | 2,551 | 21,426 | 1,529 |
| 1926..... | 1,985 | 75,534 | 1,073 | 10,254 | 652 | 2,016 | 1,860 | 2,482 | 26,188 | 1,400 |
| 1927..... | 2,013 | 74,826 | 1,229 | 13,820 | 707 | 2,175 | 1,841 | 2,275 | 28,707 | 1,509 |
| 1928..... | 2,318 | 78,466 | 1,300 | 14,332 | 825 | 2,704 | 1,829 | 2,034 | 23,012 | 1,521 |
| 1929, preliminary..... | 2,393 | 80,767 | 1,309 | 14,175 | 707 | 5,064 | 1,441 | 2,052 | 31,548 | 1,643 |

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1909-1918, and Monthly Summary of Foreign Commerce of the United States, June issues, 1920-1929.

TABLE 496.—Exports of selected domestic agricultural products, averages 1900-1909, annual 1909-1929

| Year ended June 30— | Butter | Cheese | Milk, condensed and evaporated | Eggs in the shell | Pork and its prod- ucts, total ¹ | Pork, fresh | Pork, pickled | Bacon, includ- ing Cum- berland sides | Hams and should- ers, includ- ing Wilt- shire sides | Lard |
|----------------------------|-----------------|-----------------|---|-------------------------|--|-----------------|------------------|---|--|-----------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds (²) | 1,000 dozen | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Average: 1900-1904..... | 15,425 | 31,552 | (²) | 3,125 | 1,305,217 | 28,090 | 119,050 | 361,686 | 209,954 | 576,414 |
| 1905-1909..... | 12,484 | 11,849 | (²) | 5,439 | 1,248,682 | 13,157 | 125,799 | 271,929 | 208,230 | 622,299 |
| 1909..... | 5,981 | 6,823 | (²) | 5,207 | 1,053,142 | 9,555 | 52,355 | 244,579 | 212,170 | 528,723 |
| 1910..... | 3,141 | 2,847 | 13,311 | 5,326 | 707,110 | 1,040 | 40,032 | 152,163 | 146,885 | 362,928 |
| 1911..... | 4,878 | 10,367 | 12,180 | 8,559 | 879,455 | 1,355 | 45,729 | 156,675 | 57,709 | 470,108 |
| 1912..... | 6,092 | 6,338 | 20,643 | 15,406 | 1,071,952 | 2,598 | 56,321 | 208,574 | 204,044 | 532,256 |
| 1913..... | 3,586 | 2,599 | 16,529 | 20,409 | 984,697 | 2,458 | 53,749 | 200,994 | 159,545 | 519,025 |
| 1914..... | 3,694 | 2,428 | 16,209 | 16,149 | 921,913 | 2,668 | 45,543 | 193,064 | 165,882 | 481,458 |
| 1915..... | 9,851 | 55,363 | 37,236 | 20,784 | 1,106,180 | 3,908 | 45,656 | 346,718 | 203,701 | 475,532 |
| 1916..... | 13,487 | 44,394 | 159,578 | 26,396 | 1,462,697 | 63,006 | 63,461 | 579,809 | 282,209 | 427,011 |
| 1917..... | 26,835 | 66,050 | 259,141 | 24,926 | 1,501,948 | 50,436 | 46,993 | 667,152 | 266,657 | 444,770 |
| 1918..... | 17,736 | 44,303 | 528,759 | 18,969 | 1,692,124 | 21,390 | 33,222 | 815,204 | 419,572 | 392,506 |
| 1919..... | 33,740 | 18,792 | 728,741 | 28,385 | 2,704,694 | 19,644 | 31,504 | 1,238,247 | 667,240 | 724,771 |
| 1920..... | 27,156 | 19,378 | 708,463 | 38,327 | 1,762,611 | 27,225 | 41,643 | 803,667 | 275,456 | 587,225 |
| 1921..... | 7,829 | 10,826 | 262,668 | 26,960 | 1,522,162 | 57,075 | 33,286 | 489,298 | 172,012 | 746,157 |
| 1922..... | 7,512 | 7,471 | 277,311 | 33,762 | 1,516,320 | 25,911 | 33,510 | 350,549 | 271,642 | 812,379 |
| 1923..... | 9,410 | 8,446 | 157,038 | 34,284 | 1,794,880 | 43,772 | 40,934 | 408,334 | 319,269 | 952,642 |
| 1924..... | 5,425 | 3,938 | 213,613 | 32,832 | 1,934,189 | 49,113 | 37,469 | 423,500 | 381,564 | 1,014,898 |
| 1925..... | 8,384 | 9,432 | 173,547 | 25,107 | 1,400,149 | 27,093 | 26,726 | 236,231 | 292,214 | 792,735 |
| 1926..... | 5,280 | 4,094 | 135,866 | 27,931 | 1,172,685 | 15,867 | 29,126 | 186,153 | 290,010 | 695,445 |
| 1927..... | 5,048 | 3,773 | 108,942 | 27,962 | 1,012,668 | 10,881 | 27,962 | 127,576 | 143,649 | 675,812 |
| 1928..... | 3,965 | 2,873 | 108,943 | 22,832 | 1,046,306 | 11,059 | 31,650 | 126,977 | 127,819 | 716,398 |
| 1929, preliminary.. | 3,778 | 2,572 | 112,459 | 15,982 | 1,112,526 | 10,641 | 39,906 | 129,408 | 125,306 | 780,914 |

| Year ended June 30— | Beef and its products, total ³ | Oleo oil | Cotton- lint ⁴ | Lint- ers ⁴ | Cotton- seed cake and meal | Lin- seed cake and meal | Prunes | Rais- ins | Ap- ples, fresh | Or- anges | Sugar, raw and refined ⁵ |
|----------------------------|--|-----------------|------------------------------|---------------------------|-------------------------------------|----------------------------------|-----------------|-----------------|-----------------------|------------------------------------|---|
| | 1,000 pounds | 1,000 pounds | 1,000 bales | 1,000 bales | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 barrels | 1,000 boxes (²) | 1,000 sh. tons |
| Average: 1900-1904..... | 636,969 | 147,626 | 6,669 | ..... | 1,074,720 | 552,190 | 39,767 | 3,314 | 1,109 | (²) | 6 |
| 1905-1909..... | 599,332 | 188,550 | 8,303 | ..... | 1,173,349 | 684,450 | 35,003 | 6,856 | 1,239 | (²) | 16 |
| 1909..... | 418,844 | 179,985 | 8,896 | ..... | 1,233,750 | 682,765 | 22,602 | 7,880 | 896 | 867 | 40 |
| 1910..... | 286,296 | 126,092 | 6,413 | ..... | 640,089 | 652,317 | 89,015 | 8,526 | 922 | 932 | 63 |
| 1911..... | 265,924 | 138,697 | 8,068 | ..... | 804,597 | 559,675 | 51,031 | 18,660 | 1,721 | 1,179 | 28 |
| 1912..... | 233,925 | 126,467 | 11,070 | ..... | 1,293,690 | 596,115 | 74,328 | 19,949 | 1,456 | 1,197 | 40 |
| 1913..... | 170,208 | 92,850 | 9,125 | ..... | 1,128,092 | 838,120 | 117,951 | 28,121 | 2,150 | 1,063 | 22 |
| 1914..... | 151,212 | 97,017 | 9,522 | ..... | 799,374 | 662,869 | 69,814 | 14,766 | 1,607 | 1,559 | 26 |
| 1915..... | 394,981 | 80,482 | 8,581 | 226 | 1,476,065 | 524,794 | 43,479 | 24,845 | 2,352 | 1,759 | 275 |
| 1916..... | 457,556 | 102,046 | 6,917 | 251 | 1,057,222 | 640,916 | 57,423 | 75,015 | 1,466 | 1,575 | 815 |
| 1917..... | 423,674 | 67,110 | 5,702 | 474 | 1,150,160 | 536,984 | 59,645 | 51,993 | 1,740 | 1,850 | 625 |
| 1918..... | 600,132 | 56,003 | 4,455 | 186 | 44,681 | 151,400 | 32,927 | 54,988 | 635 | 1,240 | 288 |
| 1919..... | 591,302 | 59,292 | 5,442 | 84 | 311,624 | 202,788 | 59,072 | 84,150 | 1,576 | 1,402 | 558 |
| 1920..... | 368,002 | 74,529 | 7,035 | 52 | 448,573 | 336,336 | 114,066 | 86,857 | 1,051 | 1,619 | 722 |
| 1921..... | 203,815 | 106,415 | 5,570 | 53 | 454,701 | 391,264 | 57,461 | 24,492 | 2,665 | 2,001 | 292 |
| 1922..... | 222,462 | 117,174 | 6,592 | 126 | 532,721 | 484,059 | 109,398 | 49,639 | 1,994 | 1,641 | 1,001 |
| 1923..... | 194,012 | 104,956 | 5,205 | 48 | 454,350 | 574,612 | 79,229 | 93,962 | 1,756 | 1,799 | 375 |
| 1924..... | 185,372 | 92,905 | 6,784 | 115 | 250,366 | 560,114 | 136,448 | 88,152 | 4,096 | 2,592 | 135 |
| 1925..... | 190,211 | 105,145 | 8,239 | 200 | 885,375 | 691,126 | 171,771 | 90,783 | 3,201 | 2,197 | 251 |
| 1926..... | 152,320 | 90,410 | 8,110 | 102 | 716,508 | 689,166 | 151,405 | 135,027 | 3,672 | 2,253 | 300 |
| 1927..... | 151,531 | 92,720 | 11,281 | 278 | 980,516 | 625,121 | 175,544 | 152,337 | 7,098 | 3,340 | 114 |
| 1928..... | 106,695 | 64,851 | 7,890 | 230 | 604,523 | 606,304 | 260,625 | 193,099 | 3,444 | 2,988 | 106 |
| 1929, preliminary.. | 101,334 | 63,187 | 8,520 | 219 | 751,200 | 645,120 | 273,051 | 221,801 | 7,014 | 4,223 | 128 |

Footnotes at end of table.

TABLE 496.—Exports of selected domestic agricultural products, averages 1900-1909, annual 1909-1929—Continued

| Year ended June 30— | Barley, including flour, and malt * | Corn, including corn meal | Oats, including oat- meal | Rice, including flour, meal, and broken rice | Rye, including flour | Wheat, including flour | To- bacco, un- manu- factured † | Glucose and grape sugar | Hops | Starch, including corn- starch |
|------------------------|---|------------------------------------|------------------------------------|--|----------------------------|------------------------------|---|----------------------------------|-----------------|---|
| Average: | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 pounds | 1,000 bushels | 1,000 bushels | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1900-1904..... | 11,931 | 111,484 | 22,188 | 3,511 | 2,734 | 196,690 | 328,321 | 167,108 | 11,420 | 68,173 |
| 1905-1909..... | 9,907 | 77,857 | 13,614 | 17,009 | 1,186 | 116,181 | 321,197 | 151,600 | 15,613 | 52,143 |
| 1909..... | 6,720 | 37,665 | 2,334 | 1,567 | 1,296 | 116,373 | 287,901 | 112,225 | 10,447 | 33,228 |
| 1910..... | 4,454 | 38,128 | 2,549 | 7,050 | 242 | 89,173 | 357,196 | 149,820 | 10,589 | 51,536 |
| 1911..... | 9,507 | 65,615 | 3,846 | 15,575 | 40 | 71,338 | 355,327 | 181,063 | 13,105 | 158,239 |
| 1912..... | 1,655 | 41,797 | 2,678 | 26,798 | 31 | 81,891 | 379,845 | 171,156 | 12,191 | 83,645 |
| 1913..... | 17,874 | 50,780 | 36,455 | 24,801 | 1,855 | 145,159 | 418,797 | 200,149 | 17,591 | 110,898 |
| 1914..... | 6,945 | 10,726 | 2,749 | 18,223 | 2,273 | 147,955 | 449,750 | 199,531 | 24,263 | 76,714 |
| 1915..... | 28,712 | 50,668 | 100,609 | 75,449 | 13,027 | 335,702 | 348,346 | 158,463 | 16,210 | 107,037 |
| 1916..... | 30,821 | 39,897 | 98,960 | 120,695 | 15,250 | 246,221 | 443,293 | 186,406 | 22,410 | 210,185 |
| 1917..... | 20,319 | 66,753 | 95,106 | 181,372 | 13,703 | 205,962 | 411,599 | 214,973 | 4,825 | 146,424 |
| 1918..... | 28,717 | 49,073 | 125,091 | 196,363 | 17,186 | 132,579 | 289,171 | 97,858 | 3,495 | 73,883 |
| 1919..... | 26,997 | 23,019 | 109,005 | 193,128 | 36,467 | 287,402 | 629,288 | 136,230 | 7,467 | 143,788 |
| 1920..... | 34,555 | 16,729 | 43,436 | 483,385 | 41,531 | 222,030 | 648,038 | 245,204 | 30,780 | 237,600 |
| 1921..... | 27,255 | 70,906 | 9,391 | 440,855 | 47,337 | 369,313 | 506,526 | 141,954 | 22,206 | 135,365 |
| 1922..... | 27,543 | 179,490 | 21,237 | 541,509 | 29,944 | 282,566 | 463,389 | 273,982 | 19,522 | 386,873 |
| 1923..... | 21,909 | 96,596 | 25,413 | 370,670 | 51,663 | 224,900 | 454,364 | 162,693 | 13,497 | 260,796 |
| 1924..... | 13,913 | 23,135 | 8,796 | 227,757 | 19,902 | 159,880 | 597,630 | 148,051 | 20,461 | 262,942 |
| 1925..... | 28,543 | 9,791 | 16,777 | 112,037 | 50,242 | 260,803 | 430,702 | 139,577 | 16,122 | 214,247 |
| 1926..... | 30,449 | 24,783 | 39,687 | 48,175 | 12,647 | 108,035 | 537,240 | 170,142 | 14,998 | 224,569 |
| 1927..... | 19,655 | 19,819 | 15,041 | 304,358 | 21,697 | 219,160 | 411,401 | 148,789 | 13,369 | 233,111 |
| 1928..... | 39,274 | 19,409 | 9,823 | 309,788 | 26,346 | 206,259 | 489,996 | 145,951 | 11,812 | 281,388 |
| 1929, preliminary..... | 60,295 | 41,880 | 16,242 | 392,714 | 9,488 | 163,687 | 565,984 | 123,403 | 8,836 | 236,660 |

| Year ended June 30— | Corn- starch ‡ | Apples, dried | Apri- cots, dried | Apri- cots, can- ned § | Pears, can- ned ¶ | Peaches, canned | Pine- apples, can- ned | Grapes | Pears, fresh | Grape- fruit, fresh |
|------------------------|-------------------|------------------|-------------------------|---------------------------------|-------------------------|--------------------|---------------------------------|-----------------|-----------------|---------------------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 boxes |
| 1913..... | 41,575 | 35,017 | 33,568 | 17,402 | ..... | ..... | ..... | ..... | ..... | ..... |
| 1914..... | 42,589 | 23,764 | 16,219 | 23,940 | ..... | ..... | ..... | ..... | ..... | ..... |
| 1915..... | 10,358 | 9,841 | 2,603 | 5,230 | ..... | ..... | ..... | ..... | ..... | ..... |
| 1916..... | 18,909 | 20,975 | 11,819 | 26,768 | ..... | ..... | ..... | ..... | ..... | ..... |
| 1917..... | 105,727 | 18,909 | 20,975 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1918..... | 163,315 | 11,819 | 26,768 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1919..... | 110,514 | 18,053 | 8,332 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1920..... | 348,940 | 12,431 | 16,736 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1921..... | 254,060 | 12,817 | 11,193 | 1013,809 | 49,358 | 54,624 | 21,848 | 14,022 | 36,785 | 252 |
| 1922..... | 255,135 | 30,323 | 38,777 | 26,576 | 38,431 | 50,374 | 25,238 | 20,257 | 50,237 | 305 |
| 1923..... | 200,865 | 19,225 | 13,292 | 31,360 | 53,851 | 57,390 | 26,252 | 20,302 | 41,452 | 427 |
| 1924..... | 208,463 | 24,833 | 18,132 | 29,547 | 75,876 | 83,160 | 37,543 | 24,268 | 71,205 | 379 |
| 1925..... | 212,375 | 32,670 | 17,901 | 35,896 | 60,104 | 81,890 | 37,426 | 30,791 | 73,877 | 613 |
| 1926..... | 275,921 | 21,704 | 23,684 | 29,013 | 52,671 | 86,634 | 51,227 | 38,819 | 51,056 | 719 |
| 1929, preliminary..... | 231,667 | 50,055 | 24,692 | 26,249 | 82,652 | 101,438 | 47,533 | 55,638 | 82,847 | 940 |

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1900-1918, and Monthly Summary of Foreign Commerce of the United States, June issues 1921-1929.

Conversion factors used: Corn meal, 1 barrel=4 bushels corn; oatmeal, 18 pounds=1 bushel oats; rye flour, 1 barrel=6 bushels rye; malt, 1.1 bushels=1 bushel barley; wheat flour, 1 barrel=1900-1908, 4.75 bushels grain; 1909-1917, 4.7 bushels; 1918 and 1919, 4.5 bushels; 1920, 4.6 bushels; 1921-1929, 4.7 bushels; apples, 8 boxes=1 barrel.

* Includes canned, fresh, salted, or pickled pork, lard, neutral lard, lard oil, bacon, and hams.

† Reported in value only.

‡ Includes canned, cured, and fresh beef, oleo oil, oleo stock, oleomargarine, tallow, and stearin from animal fats.

§ Bales of 500 pounds gross; lint cotton and linters not separately reported prior to 1915.

¶ Includes maple sugar, 1919-1929.

§ Includes barley flour 1919-1922. Barley flour not separately reported prior to 1919 nor since 1922.

¶ Includes "Stems, trimmings, and scrap tobacco."

§ Included with "Starch" prior to 1918.

¶ Given in value only prior to 1923.

† Jan. 1 to June 30.

FOREIGN TRADE IN AGRICULTURAL PRODUCTS

947

TABLE 497.—Imports of selected agricultural products, averages 1900-1909, annual 1909-1929

| Year ended June 30— | Butter | Cheese | Beef and veal, fresh | Cattle hides | Goat- skins | Total hides and skins except furs | Silk 1 | Cotton, unman- ufactured | Wool, unman- ufactured, including mohair, etc. | Total tobac- co, un- manu- factured |
|------------------------|-----------------|-----------------|-------------------------------|-----------------|-----------------|--|-----------------|--------------------------------|--|---|
| Average: | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1900-1904 | 192 | 17,846 | (9) | 131,736 | 83,047 | 309,360 | 13,942 | 67,292 | 155,394 | 28,216 |
| 1905-1909 | 532 | 30,462 | (9) | 138,922 | 95,555 | 372,292 | 20,061 | 78,771 | 209,413 | 38,688 |
| 1909 | 646 | 35,548 | (9) | 192,252 | 104,048 | 444,554 | 25,188 | 86,518 | 266,409 | 43,123 |
| 1910 | 1,360 | 40,818 | (9) | 318,004 | 115,845 | 608,619 | 23,457 | 89,038 | 263,928 | 46,853 |
| 1911 | 1,008 | 45,569 | (9) | 150,128 | 86,914 | 374,891 | 26,666 | 113,768 | 137,648 | 48,203 |
| 1912 | 1,026 | 46,542 | (9) | 251,012 | 95,341 | 537,788 | 26,585 | 109,780 | 193,401 | 54,740 |
| 1913 | 1,162 | 49,388 | (9) | 268,042 | 96,250 | 572,197 | 32,101 | 121,852 | 195,293 | 67,977 |
| 1914 | 7,842 | 63,784 | 180,137 | 279,963 | 84,759 | 561,071 | 34,546 | 123,347 | 247,649 | 61,175 |
| 1915 | 3,828 | 50,139 | 184,491 | 344,341 | 66,547 | 538,218 | 31,053 | 185,205 | 308,083 | 45,809 |
| 1916 | 713 | 30,088 | 71,102 | 434,178 | 100,657 | 743,670 | 41,925 | 232,801 | 534,828 | 48,078 |
| 1917 | 524 | 14,482 | 15,217 | 386,600 | 105,640 | 700,207 | 40,351 | 147,062 | 372,372 | 49,105 |
| 1918 | 1,806 | 9,839 | 25,452 | 267,500 | 66,933 | 432,577 | 43,681 | 103,326 | 379,130 | 86,991 |
| 1919 | 4,131 | 2,442 | 36,670 | 253,877 | 89,005 | 448,142 | 50,069 | 103,592 | 422,415 | 83,951 |
| 1920 | 20,771 | 17,914 | 42,436 | 439,461 | 126,996 | 798,569 | 58,410 | 345,314 | 427,578 | 94,005 |
| 1921 | 34,344 | 16,585 | 41,956 | 198,573 | 41,728 | 352,193 | 34,778 | 125,939 | 318,236 | 58,923 |
| 1922 | 9,551 | 34,271 | 28,001 | 204,936 | 83,535 | 392,904 | 57,437 | 179,165 | 255,087 | 65,225 |
| 1923 | 15,772 | 54,556 | 32,481 | 405,383 | 89,401 | 682,893 | 63,188 | 236,092 | 525,473 | 75,786 |
| 1924 | 29,466 | 66,597 | 25,144 | 176,475 | 65,881 | 365,194 | 50,595 | 146,024 | 239,122 | 54,497 |
| 1925 | 7,169 | 61,489 | 12,419 | 199,310 | 65,956 | 387,447 | 70,270 | 155,092 | 284,706 | 76,870 |
| 1926 | 6,440 | 62,412 | 18,279 | 155,587 | 80,484 | 355,266 | 76,838 | 161,454 | 345,512 | 69,974 |
| 1927 | 10,710 | 89,782 | 22,068 | 156,938 | 83,571 | 368,876 | 85,162 | 190,993 | 271,128 | 92,983 |
| 1928 | 4,955 | 75,424 | 47,050 | 307,362 | 84,751 | 532,379 | 87,128 | 175,450 | 248,035 | 81,045 |
| 1929, preliminary | 3,298 | 84,606 | 62,481 | 210,371 | 94,476 | 447,369 | 90,807 | 227,454 | 270,936 | 79,284 |

| Year ended June 30— | Rubber and similar gums, crude, total | Coffee | Tea | Cocoa or cacao beans | Banna- nas | Olives | Lemons | Onions | Beans, dry |
|------------------------|--|-----------------|-----------------|-------------------------------|------------------|------------------|----------------|------------------|------------------|
| Average: | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 bunches | 1,000 gallons | 1,000 boxes | 1,000 bushels | 1,000 bushels |
| 1900-1904 | 66,973 | 928,799 | 94,342 | 54,936 | (9) | (9) | 2,153 | 843 | 1,002 |
| 1905-1909 | 95,054 | 905,058 | 98,353 | 91,774 | 36,988 | 2,796 | 2,025 | 941 | 1,270 |
| 1909 | 114,599 | 1,049,860 | 114,917 | 129,855 | 36,974 | 2,969 | 1,827 | 575 | 3,355 |
| 1910 | 154,621 | 871,470 | 85,626 | 108,668 | 38,157 | 4,555 | 2,165 | 1,024 | 1,015 |
| 1911 | 145,744 | 875,367 | 102,564 | 138,058 | 44,699 | 3,045 | 1,824 | 1,515 | 1,037 |
| 1912 | 175,966 | 885,201 | 101,407 | 145,969 | 44,521 | 5,077 | 1,968 | 1,436 | 1,005 |
| 1913 | 170,747 | 863,131 | 94,813 | 140,039 | 42,357 | 3,946 | 2,046 | 789 | 1,048 |
| 1914 | 1,001,777 | 1,001,528 | 91,131 | 176,268 | 48,684 | 5,316 | (9) | 1,115 | 1,634 |
| 1915 | 196,122 | 1,118,691 | 96,988 | 192,307 | 41,092 | 3,622 | (9) | 829 | 906 |
| 1916 | 304,183 | 1,201,104 | 109,866 | 243,232 | 36,755 | 5,938 | (9) | 816 | 663 |
| 1917 | 364,914 | 1,319,871 | 103,364 | 338,654 | 34,661 | 5,642 | (9) | 1,758 | 3,748 |
| 1918 | 414,984 | 1,143,891 | 151,315 | 399,040 | 34,550 | 2,385 | (9) | 1,313 | 4,146 |
| 1919 | 422,215 | 1,046,029 | 108,172 | 313,037 | 35,382 | 3,501 | (9) | 1,624 | 4,016 |
| 1920 | 660,610 | 1,414,228 | 97,826 | 420,331 | 36,848 | 5,206 | (9) | 1,824 | 3,806 |
| 1921 | 371,300 | 1,348,926 | 72,196 | 327,123 | 40,808 | 4,054 | (9) | 689 | 824 |
| 1922 | 578,512 | 1,238,012 | 86,142 | 317,124 | 46,120 | (9) | 1,373 | 2,498 | 520 |
| 1923 | 810,028 | 1,305,188 | 96,669 | 381,508 | 44,504 | (9) | 1,660 | 1,783 | 2,623 |
| 1924 | 633,489 | 1,429,617 | 105,443 | 382,971 | 44,935 | 6,848 | 1,018 | 1,406 | 886 |
| 1925 | 824,434 | 1,279,570 | 92,779 | 382,570 | 50,513 | 5,901 | 1,264 | 2,075 | 1,421 |
| 1926 | 952,659 | 1,437,364 | 99,411 | 417,060 | 58,550 | 5,992 | 1,247 | 2,194 | 1,271 |
| 1927 | 993,272 | 1,444,847 | 97,402 | 425,184 | 57,102 | 5,212 | 659 | 2,298 | 1,051 |
| 1928 | 959,245 | 1,535,392 | 90,099 | 411,543 | 64,029 | 6,458 | 1,308 | 1,399 | 2,465 |
| 1929, preliminary | 1,252,130 | 1,435,070 | 92,635 | 419,243 | 63,530 | 6,955 | 391 | 2,050 | 1,605 |

Footnotes at end of table.

TABLE 497.—Imports of selected agricultural products, averages 1900–1909, annual 1909–1929—Continued

| Year ended June 30— | Al- monds in terms of shelled ^a | Pea- nuts in terms of shelled ^a | Wal- nuts in terms of shelled ^a | Coco- nut meat ⁷ | Flax- seed | Sugar, raw and refined | Mo- lasses | Jute and jute butts, un- man- ufactured | Manilk. or abaca | Sisal and hene- quen |
|------------------------|---|---|---|-----------------------------------|------------------|---------------------------------|------------------|---|------------------------|-------------------------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 bushels | 1,000 short tons | 1,000 gallons | 1,000 long tons | 1,000 long tons | 1,000 long tons |
| Average: 1900–1904 | 7,862 | (^a) | ^a 18,017 | (^a) | 504 | 1,894 | 13,788 | 102 | 54 | 87 |
| 1905–1909 | 13,832 | (^a) | 20,849 | ^a 15,010 | 218 | 1,961 | 20,221 | 114 | 58 | 98 |
| 1909 | 11,029 | (^a) | 26,188 | 23,843 | 594 | 2,095 | 22,093 | 157 | 62 | 91 |
| 1910 | 18,556 | 29,276 | 33,641 | 21,306 | 5,002 | 2,047 | 31,292 | 68 | 93 | 100 |
| 1911 | 18,834 | 18,834 | 33,619 | 37,817 | 10,499 | 1,969 | 23,838 | 65 | 74 | 118 |
| 1912 | 17,231 | 11,248 | 37,214 | 69,912 | 6,842 | 2,052 | 28,828 | 101 | 69 | 114 |
| 1913 | 13,856 | 14,989 | 17,213 | 40,870 | 5,294 | 2,370 | 33,927 | 125 | 74 | 154 |
| 1914 | 15,027 | 38,726 | 20,800 | 55,735 | 8,653 | 2,533 | 51,410 | 106 | 50 | 216 |
| 1915 | 13,679 | 19,338 | 20,490 | 96,485 | 10,686 | 2,710 | 70,840 | 83 | 51 | 186 |
| 1916 | 14,546 | 25,407 | 23,733 | 118,613 | 14,679 | 2,817 | 85,717 | 108 | 79 | 229 |
| 1917 | 19,916 | 32,385 | 23,839 | 256,801 | 12,394 | 2,666 | 110,238 | 113 | 77 | 143 |
| 1918 | 20,845 | 75,463 | 16,252 | 507,576 | 13,367 | 2,452 | 130,731 | 78 | 86 | 150 |
| 1919 | 25,615 | 20,425 | 9,057 | 315,749 | 8,427 | 2,918 | 130,075 | 53 | 68 | 153 |
| 1920 | 28,533 | 128,390 | 28,961 | 258,229 | 23,392 | 3,798 | 154,670 | 77 | 77 | 176 |
| 1921 | 15,861 | 46,202 | 15,902 | 213,134 | 16,170 | 3,506 | 113,414 | 90 | 52 | 159 |
| 1922 | 28,036 | 9,678 | 35,174 | 204,104 | 13,632 | 4,232 | 87,908 | 62 | 44 | 72 |
| 1923 | 24,345 | 45,013 | 25,970 | 338,587 | 25,006 | 4,367 | 161,135 | 85 | 98 | 98 |
| 1924 | 24,207 | 60,683 | 26,428 | 344,920 | 19,577 | 3,765 | 174,037 | 84 | 98 | 97 |
| 1925 | 22,503 | 93,191 | 36,623 | 371,961 | 13,419 | 4,337 | 215,778 | 56 | 73 | 146 |
| 1926 | 19,686 | 36,026 | 31,698 | 444,278 | 19,354 | 4,420 | 256,246 | 71 | 62 | 126 |
| 1927 | 15,890 | 49,792 | 31,776 | 507,136 | 24,224 | 4,420 | 260,259 | 89 | 61 | 116 |
| 1928 | 18,496 | 63,793 | 20,347 | 518,173 | 18,112 | 4,045 | 248,427 | 81 | 48 | 128 |
| 1929, preliminary | 18,678 | 30,412 | 24,500 | 687,121 | 23,437 | 4,752 | 296,550 | 92 | 60 | 135 |

| Year ended June 30— | Milk and cream, fresh | Cream, fresh | Eggs, whole, in the shell | Eggs and egg yolks, dried, frozen, or pre- pared | Whole eggs, dried | Whole eggs, frozen | Yolks, dried | Yolks, frozen | Egg al- bu- men, dried | Egg al- bu- men, fro- zen, pre- pared and pre- served | Hair of the Angora (mo- hair) |
|------------------------|--------------------------------|---------------------|------------------------------------|--|-------------------------|--------------------------|-------------------|---------------------|---------------------------------|--|---|
| | 1,000 gallons | 1,000 gallons | 1,000 dozen | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1913 | (^a) | 1,247 | 1,367 | 228 | | | | | (^a) | | |
| 1914 | (^a) | 1,773 | 6,015 | 3,420 | | | | | (^a) | | |
| 1915 | (^a) | 2,077 | 3,047 | 8,572 | | | | | (^a) | | |
| 1916 | (^a) | 1,194 | 733 | 6,022 | | | | | (^a) | | |
| 1917 | (^a) | 744 | 1,110 | 10,318 | | | | | (^a) | | |
| 1918 | (^a) | 712 | 1,619 | 14,598 | | | | | (^a) | | |
| 1919 | 2,592 | (^a) | 848 | 9,085 | | | | | (^a) | | |
| 1920 | 3,989 | (^a) | 1,348 | 24,091 | | | | | (^a) | | |
| 1921 | 4,391 | (^a) | 3,316 | 28,768 | | | | | (^a) | | |
| 1922 | 4,536 | (^a) | 1,224 | 16,540 | | | | | (^a) | | |
| 1923 | 5,148 | (^a) | 535 | 14,821 | | | | | 7,388 | | |
| 1924 | 6,623 | ¹⁰ 1,646 | 426 | ¹¹ 14,830 | ¹⁰ 544 | ¹⁰ 1,106 | ¹⁰ 522 | ¹⁰ 1,210 | 3,213 | ⁹ 7,220 | |
| 1925 | 6,418 | 4,765 | 682 | | 1,884 | 8,751 | 4,281 | 4,151 | 6,642 | 3,583 | |
| 1926 | 7,479 | 4,798 | 276 | | 1,365 | 12,647 | 6,004 | 5,662 | 3,257 | 1,106 | 2,404 |
| 1927 | 6,106 | 5,273 | 296 | | 1,132 | 8,114 | 4,468 | 4,601 | 3,859 | 5,119 | 6,463 |
| 1928 | 5,425 | 4,819 | 256 | | 575 | 611 | 3,486 | 1,229 | 2,361 | 3,967 | 6,547 |
| 1929, preliminary | 5,016 | 3,173 | 291 | | 2,133 | 12,616 | 5,130 | 4,581 | 2,898 | 553 | 2,204 |

Bureau of Agricultural Economics. Compiled from Commerce and Navigation of the United States, 1900–1918, and Monthly Summary of Foreign Commerce, June issue, 1919–1929.

¹ Includes "Silk, raw or as reeled from cocoon," "Silk waste," and "Silk cocoons."

² Not separately classified.

³ Reported in value only.

⁴ 2-year average.

⁵ 3-year average.

⁶ Conversion factors used: Almonds, 30 per cent unshelled equals shelled. Peanuts, 3 pounds unshelled equals 2 pounds shelled. Walnuts, 42 per cent unshelled equals shelled.

⁷ Includes broken, or shredded, desiccated or prepared and copra.

⁸ Included with "All other nuts."

⁹ Beginning Sept. 22, 1922.

¹⁰ Beginning Jan. 1, 1924.

¹¹ July 1–Dec. 31, 1923.

TABLE 498.—*Destination of principal agricultural products exported from the United States, 1926-1929*

| Article and country to which exported | Year ended June 30— | | | | | | | |
|---|---------------------|--------------|--------------|--------------|----------|----------|----------|----------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | Per cent | Per cent | Per cent | Per cent |
| ANIMALS AND ANIMAL PRODUCTS | | | | | | | | |
| Butter: Total..... | 5,280 | 5,048 | 3,965 | 3,778 | 100.0 | 100.0 | 100.0 | 100.0 |
| Mexico..... | 1,015 | 859 | 724 | 672 | 19.2 | 17.0 | 18.3 | 18.0 |
| Cuba..... | 782 | 734 | 479 | 370 | 14.8 | 14.5 | 12.1 | 9.8 |
| Panama..... | 719 | 582 | 311 | 227 | 13.6 | 11.5 | 7.8 | 6.0 |
| Haitian Republic..... | 585 | 498 | 479 | 479 | 11.1 | 9.9 | 12.1 | 12.7 |
| Other West Indies ¹ | 479 | 550 | 391 | 394 | 9.1 | 10.9 | 9.9 | 10.4 |
| Peru..... | 424 | 356 | 358 | 451 | 8.0 | 7.1 | 9.0 | 11.9 |
| Other South America..... | 384 | 605 | 800 | 485 | 7.3 | 12.0 | 9.8 | 12.8 |
| Philippine Islands..... | 230 | 187 | 190 | 152 | 4.4 | 3.7 | 4.8 | 4.0 |
| Other countries..... | 602 | 677 | 643 | 548 | 12.5 | 13.4 | 16.2 | 14.4 |
| Cheese: Total..... | 4,094 | 3,773 | 2,873 | 2,572 | 100.0 | 100.0 | 100.0 | 100.0 |
| Canada..... | 216 | 350 | 259 | 170 | 5.3 | 9.3 | 9.0 | 6.6 |
| Cuba..... | 910 | 832 | 359 | 405 | 22.2 | 22.1 | 12.5 | 15.7 |
| Other West Indies ¹ | 609 | 479 | 331 | 360 | 14.7 | 12.7 | 11.5 | 14.0 |
| Mexico..... | 940 | 670 | 581 | 423 | 23.0 | 17.8 | 20.2 | 16.4 |
| Panama..... | 403 | 434 | 432 | 460 | 9.8 | 11.5 | 15.0 | 17.9 |
| Other Central America..... | 278 | 284 | 293 | 294 | 6.8 | 7.5 | 10.2 | 11.4 |
| China..... | 233 | 252 | 145 | 89 | 5.7 | 6.7 | 5.0 | 3.5 |
| Other countries..... | 514 | 472 | 473 | 371 | 12.5 | 12.4 | 16.6 | 14.5 |
| Milk: Condensed— | | | | | | | | |
| Total..... | 42,656 | 35,799 | 36,975 | 39,598 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 479 | 424 | 151 | 70 | 1.1 | 1.2 | .4 | .2 |
| Cuba..... | 16,337 | 12,843 | 11,462 | 13,103 | 38.3 | 35.9 | 31.0 | 33.1 |
| Philippine Islands..... | 7,767 | 6,471 | 7,575 | 7,339 | 18.2 | 18.1 | 20.5 | 18.5 |
| Japan, including Chosen..... | 4,744 | 4,029 | 5,385 | 5,473 | 11.1 | 11.3 | 14.6 | 13.8 |
| China..... | 3,811 | 3,621 | 2,513 | 2,840 | 8.9 | 10.1 | 6.8 | 7.2 |
| Hongkong..... | 1,992 | 2,065 | 3,764 | 3,739 | 4.7 | 5.8 | 10.2 | 9.4 |
| Mexico..... | 1,285 | 1,308 | 985 | 883 | 3.0 | 3.7 | 2.7 | 2.2 |
| Other countries..... | 6,211 | 5,038 | 5,140 | 6,151 | 14.7 | 13.9 | 13.8 | 15.6 |
| Evaporated— | | | | | | | | |
| Total..... | 93,210 | 73,143 | 71,968 | 72,861 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 52,147 | 30,527 | 24,401 | 22,267 | 55.9 | 41.7 | 33.9 | 30.6 |
| Germany..... | 19,306 | 1,851 | 16 | 71 | 20.7 | 2.5 | .0 | .1 |
| United Kingdom..... | 29,181 | 27,418 | 23,805 | 21,759 | 31.3 | 37.5 | 33.1 | 29.9 |
| Belgium..... | 427 | 286 | 389 | 265 | .5 | .4 | .5 | .4 |
| Other Europe..... | 3,223 | 972 | 191 | 172 | 3.4 | 1.3 | .3 | .2 |
| Philippine Islands..... | 12,902 | 12,306 | 15,563 | 16,372 | 13.8 | 17.5 | 21.6 | 22.5 |
| Peru..... | 3,737 | 4,215 | 3,569 | 3,994 | 4.0 | 5.8 | 5.0 | 5.5 |
| Panama..... | 3,597 | 4,127 | 3,589 | 4,606 | 3.9 | 5.6 | 5.0 | 6.3 |
| Cuba..... | 2,942 | 2,958 | 2,647 | 2,272 | 3.2 | 4.0 | 3.7 | 3.1 |
| China..... | 3,227 | 3,025 | 3,035 | 3,447 | 3.5 | 4.1 | 4.2 | 4.7 |
| Mexico..... | 3,293 | 2,714 | 2,157 | 2,185 | 3.5 | 3.7 | 3.0 | 3.0 |
| British Malaya..... | 1,853 | 1,932 | 2,817 | 2,761 | 2.0 | 2.6 | 3.9 | 3.8 |
| Japan..... | 1,512 | 1,616 | 2,460 | 2,544 | 1.6 | 2.2 | 3.4 | 3.5 |
| Other countries..... | 8,000 | 9,223 | 11,724 | 12,413 | 8.6 | 12.8 | 16.3 | 17.0 |
| Bacon, including Cumberland sides: Total..... | 186,153 | 127,543 | 126,967 | 120,408 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 156,817 | 98,561 | 99,554 | 103,394 | 84.2 | 77.3 | 78.4 | 79.9 |
| United Kingdom..... | 106,909 | 68,220 | 50,127 | 53,524 | 57.4 | 53.5 | 39.5 | 41.4 |
| Germany..... | 14,043 | 6,818 | 9,838 | 5,982 | 7.5 | 5.3 | 7.7 | 4.6 |
| Norway..... | 7,060 | 2,422 | 3,244 | 2,742 | 3.8 | 1.9 | 2.6 | 2.1 |
| Netherlands..... | 6,379 | 2,502 | 632 | 1,198 | 3.4 | 2.0 | .5 | .9 |
| Finland..... | 3,672 | 4,493 | 6,075 | 4,633 | 2.0 | 3.5 | 4.8 | 3.6 |
| Italy..... | 3,264 | 1,439 | 8,113 | 15,106 | 1.8 | 1.1 | 6.4 | 11.7 |
| Other Europe..... | 15,500 | 12,667 | 21,525 | 20,209 | 8.3 | 10.0 | 16.9 | 15.6 |
| Cuba..... | 22,085 | 21,070 | 19,107 | 16,698 | 11.9 | 16.5 | 15.0 | 12.9 |
| Canada..... | 4,780 | 4,584 | 5,173 | 5,769 | 2.6 | 3.6 | 4.1 | 4.5 |
| Other countries..... | 2,471 | 3,328 | 3,133 | 3,547 | 1.3 | 2.6 | 2.5 | 2.7 |

See footnotes at end of table.

TABLE 498.—*Destination of principal agricultural products exported from the United States, 1926-1929—Continued*

| Article and country to which exported | Year ended June 30— | | | | | | | |
|--|---------------------|---------------------|---------------------|---------------------|-----------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| ANIMALS AND ANIMAL PRODUCTS—continued | | | | | | | | |
| Hams and shoulders, including Wiltshire sides: | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>Per cent</i> | <i>Per cent</i> | <i>Per cent</i> | <i>Per cent</i> |
| Total..... | 220, 015 | 143, 649 | 127, 819 | 125, 396 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 196, 592 | 126, 266 | 106, 526 | 103, 986 | 89. 4 | 87. 9 | 83. 3 | 82. 9 |
| United Kingdom..... | 190, 136 | 124, 391 | 104, 020 | 100, 959 | 86. 4 | 86. 6 | 81. 4 | 80. 5 |
| Belgium..... | 3, 929 | 451 | 660 | 1, 004 | 1. 8 | . 3 | . 5 | . 8 |
| Other Europe..... | 2, 527 | 1, 424 | 1, 846 | 2, 023 | 1. 2 | 1. 0 | 1. 4 | 1. 6 |
| Cuba..... | 10, 553 | 6, 548 | 8, 167 | 7, 320 | 4. 8 | 4. 6 | 6. 4 | 5. 8 |
| Canada..... | 6, 099 | 4, 803 | 6, 134 | 6, 309 | 2. 8 | 3. 3 | 4. 8 | 5. 0 |
| Other countries..... | 6, 771 | 6, 032 | 6, 992 | 7, 781 | 3. 0 | 4. 2 | 5. 5 | 6. 3 |
| Pork: | | | | | | | | |
| Canned— | | | | | | | | |
| Total..... | 5, 947 | 6, 731 | 8, 614 | 7, 965 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 5, 242 | 5, 675 | 7, 729 | 6, 700 | 88. 1 | 84. 3 | 89. 7 | 84. 1 |
| United Kingdom..... | 5, 196 | 5, 595 | 7, 632 | 6, 555 | 87. 4 | 83. 1 | 88. 6 | 82. 3 |
| Other Europe..... | 46 | 80 | 97 | 145 | . 7 | 1. 2 | 1. 1 | 1. 8 |
| Other countries..... | 705 | 1, 056 | 885 | 1, 265 | 11. 9 | 15. 7 | 10. 3 | 15. 9 |
| Fresh— | | | | | | | | |
| Total..... | 15, 868 | 10, 881 | 11, 059 | 10, 641 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 11, 660 | 7, 388 | 7, 420 | 7, 062 | 73. 5 | 67. 9 | 67. 1 | 66. 4 |
| United Kingdom..... | 10, 686 | 7, 128 | 6, 418 | 4, 547 | 67. 3 | 65. 5 | 58. 0 | 42. 7 |
| Other Europe..... | 974 | 260 | 1, 002 | 2, 515 | 6. 2 | 2. 4 | 9. 1 | 23. 7 |
| Cuba..... | 2, 138 | 1, 763 | 1, 557 | 1, 732 | 13. 5 | 16. 2 | 14. 1 | 16. 3 |
| Canada..... | 1, 194 | 590 | 798 | 582 | 7. 5 | 5. 4 | 7. 2 | 5. 5 |
| Other countries..... | 876 | 1, 140 | 1, 284 | 1, 265 | 5. 5 | 10. 5 | 11. 6 | 11. 8 |
| Pickled— | | | | | | | | |
| Total..... | 29, 126 | 27, 962 | 31, 650 | 39, 906 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 5, 871 | 4, 801 | 7, 016 | 10, 248 | 20. 2 | 17. 2 | 22. 2 | 25. 7 |
| United Kingdom..... | 2, 972 | 3, 857 | 5, 184 | 7, 608 | 10. 2 | 13. 8 | 16. 4 | 19. 1 |
| Norway..... | 1, 469 | 394 | 722 | 854 | 5. 0 | 1. 4 | 2. 3 | 2. 1 |
| Germany..... | 476 | 134 | 289 | 366 | 1. 6 | . 5 | . 9 | . 9 |
| Other Europe..... | 954 | 416 | 821 | 1, 420 | 3. 4 | 1. 5 | 2. 6 | 3. 6 |
| Canada..... | 7, 889 | 5, 800 | 7, 056 | 8, 506 | 27. 1 | 20. 7 | 22. 3 | 21. 5 |
| Newfoundland and Labrador | 3, 580 | 3, 532 | 3, 734 | 4, 530 | 12. 3 | 12. 6 | 11. 8 | 11. 4 |
| Cuba..... | 5, 935 | 7, 760 | 7, 626 | 10, 550 | 20. 4 | 27. 8 | 24. 1 | 26. 4 |
| British West Indies and | | | | | | | | |
| Bermudas..... | 2, 457 | 2, 730 | 2, 851 | 2, 810 | 8. 4 | 9. 8 | 9. 0 | 7. 0 |
| Haitian Republic..... | 972 | 917 | 1, 055 | 838 | 3. 3 | 3. 3 | 3. 3 | 2. 1 |
| Other countries..... | 2, 422 | 2, 422 | 2, 312 | 2, 334 | 8. 3 | 8. 6 | 7. 3 | 5. 9 |
| Lard: | | | | | | | | |
| Total..... | 695, 445 | 675, 812 | 716, 398 | 780, 914 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 518, 691 | 489, 376 | 519, 188 | 555, 697 | 74. 6 | 72. 4 | 72. 5 | 71. 2 |
| Germany..... | 208, 541 | 174, 621 | 176, 771 | 195, 695 | 30. 0 | 25. 8 | 24. 7 | 25. 1 |
| United Kingdom..... | 218, 146 | 222, 086 | 233, 664 | 229, 899 | 31. 4 | 32. 9 | 32. 6 | 29. 4 |
| Netherlands..... | 41, 479 | 46, 071 | 35, 784 | 36, 992 | 6. 0 | 6. 8 | 5. 0 | 4. 7 |
| Italy..... | 13, 891 | 7, 642 | 20, 384 | 29, 200 | 2. 0 | 1. 1 | 2. 8 | 3. 7 |
| Belgium..... | 14, 092 | 12, 718 | 14, 641 | 14, 841 | 2. 0 | 1. 9 | 2. 0 | 1. 9 |
| Other Europe..... | 22, 542 | 26, 238 | 38, 144 | 49, 070 | 3. 2 | 3. 9 | 5. 4 | 6. 4 |
| Cuba..... | 77, 377 | 79, 599 | 78, 469 | 84, 316 | 11. 1 | 11. 8 | 11. 0 | 10. 8 |
| Other countries..... | 99, 377 | 100, 837 | 118, 741 | 140, 901 | 14. 3 | 15. 8 | 16. 5 | 18. 0 |
| Lard, neutral: | | | | | | | | |
| Total..... | 20, 132 | 20, 057 | 23, 799 | 18, 315 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 18, 041 | 18, 283 | 21, 809 | 16, 553 | 92. 6 | 91. 2 | 91. 6 | 90. 4 |
| Germany..... | 5, 519 | 5, 895 | 5, 623 | 4, 023 | 27. 4 | 29. 4 | 23. 6 | 22. 0 |
| Netherlands..... | 4, 645 | 5, 260 | 6, 784 | 4, 710 | 23. 1 | 26. 2 | 28. 5 | 25. 7 |
| United Kingdom..... | 4, 039 | 3, 530 | 5, 096 | 3, 919 | 20. 1 | 17. 6 | 21. 4 | 21. 4 |
| Norway..... | 1, 315 | 1, 039 | 1, 228 | 895 | 6. 5 | 5. 2 | 5. 2 | 4. 9 |
| Denmark..... | 1, 001 | 726 | 1, 176 | 894 | 5. 0 | 3. 6 | 4. 9 | 4. 9 |
| Sweden..... | 904 | 912 | 696 | 649 | 4. 5 | 4. 5 | 2. 9 | 3. 5 |
| Other Europe..... | 1, 218 | 921 | 1, 206 | 1, 463 | 6. 0 | 4. 7 | 5. 1 | 8. 0 |
| Other countries..... | 1, 491 | 1, 774 | 1, 990 | 1, 762 | 7. 4 | 8. 8 | 8. 4 | 9. 6 |

TABLE 498.—*Destination of principal agricultural products exported from the United States, 1926-1929—Continued*

| Article and country to which exported | Year ended June 30— | | | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|----------|----------|----------|----------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| ANIMALS AND ANIMAL PRODUCTS—continued | | | | | | | | |
| Oleo oil: | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | Per cent | Per cent | Per cent | Per cent |
| Total..... | 90, 410 | 92, 720 | 64, 851 | 63, 187 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 87, 177 | 88, 128 | 61, 611 | 59, 481 | 96. 4 | 95. 0 | 95. 0 | 94. 1 |
| Netherlands..... | 26, 271 | 27, 270 | 17, 608 | 16, 744 | 29. 1 | 29. 4 | 27. 2 | 26. 5 |
| Germany..... | 24, 005 | 25, 443 | 18, 267 | 16, 835 | 26. 6 | 27. 4 | 28. 2 | 26. 6 |
| United Kingdom..... | 17, 611 | 18, 691 | 16, 092 | 16, 328 | 19. 5 | 20. 2 | 24. 8 | 25. 8 |
| Norway..... | 5, 541 | 5, 460 | 3, 596 | 2, 763 | 6. 1 | 5. 9 | 5. 5 | 4. 4 |
| Greece..... | 5, 735 | 3, 972 | 454 | 002 | 6. 3 | 4. 3 | . 7 | 1. 0 |
| Other Europe..... | 8, 014 | 7, 292 | 5, 594 | 6, 209 | 8. 8 | 7. 8 | 8. 6 | 9. 8 |
| Other countries..... | 3, 233 | 4, 592 | 3, 240 | 3, 706 | 3. 6 | 5. 0 | 5. 0 | 5. 9 |
| VEGETABLE PRODUCTS | | | | | | | | |
| Cotton, excluding linters: | 1,000 bales ¹ | 1,000 bales ¹ | 1,000 bales ¹ | 1,000 bales ¹ | | | | |
| Total..... | 8, 110 | 11, 281 | 7, 890 | 8, 520 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 6, 624 | 8, 813 | 6, 428 | 6, 598 | 81. 7 | 78. 1 | 81. 5 | 77. 4 |
| United Kingdom..... | 2, 278 | 2, 623 | 1, 443 | 1, 918 | 28. 1 | 23. 3 | 18. 3 | 22. 5 |
| Germany..... | 1, 657 | 2, 829 | 2, 090 | 1, 891 | 20. 4 | 25. 1 | 26. 5 | 22. 2 |
| France..... | 927 | 1, 063 | 904 | 841 | 11. 4 | 9. 4 | 11. 5 | 9. 9 |
| Italy..... | 743 | 841 | 708 | 765 | 9. 2 | 7. 5 | 9. 0 | 9. 0 |
| Other Europe..... | 1, 019 | 1, 457 | 1, 283 | 1, 183 | 12. 6 | 12. 8 | 16. 2 | 13. 8 |
| Japan..... | 1, 118 | 1, 644 | 1, 007 | 1, 373 | 13. 8 | 14. 6 | 12. 8 | 16. 1 |
| Other countries..... | 368 | 824 | 455 | 549 | 4. 5 | 7. 3 | 5. 7 | 6. 5 |
| Linters: | | | | | | | | |
| Total..... | 102 | 278 | 231 | 219 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 88 | 258 | 212 | 198 | 86. 3 | 92. 8 | 91. 8 | 90. 4 |
| Germany..... | 33 | 154 | 132 | 120 | 32. 4 | 55. 4 | 57. 1 | 54. 8 |
| France..... | 16 | 26 | 36 | 32 | 15. 7 | 9. 4 | 15. 6 | 14. 6 |
| United Kingdom..... | 19 | 51 | 22 | 16 | 18. 6 | 18. 3 | 9. 5 | 7. 3 |
| Belgium..... | 4 | 12 | 7 | 12 | 3. 9 | 4. 3 | 3. 0 | 5. 5 |
| Other Europe..... | 16 | 15 | 15 | 18 | 15. 7 | 5. 4 | 6. 6 | 8. 2 |
| Canada..... | 14 | 20 | 18 | 19 | 13. 7 | 7. 2 | 7. 8 | 8. 7 |
| Other countries..... | 0 | 0 | 1 | 2 | . 0 | . 0 | . 4 | . 9 |
| Fruits: | | | | | | | | |
| Dried— | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | | | |
| Apples— | | | | | | | | |
| Total..... | 24, 833 | 32, 670 | 21, 704 | 50, 024 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 23, 840 | 31, 313 | 20, 735 | 48, 808 | 96. 0 | 95. 8 | 95. 5 | 97. 6 |
| Germany..... | 8, 804 | 12, 158 | 10, 877 | 22, 085 | 35. 7 | 37. 2 | 50. 1 | 44. 1 |
| Netherlands..... | 7, 871 | 9, 568 | 3, 315 | 12, 451 | 31. 7 | 29. 3 | 15. 3 | 24. 9 |
| United Kingdom..... | 1, 902 | 2, 282 | 1, 018 | 2, 618 | 7. 7 | 7. 0 | 4. 7 | 5. 2 |
| Sweden..... | 1, 975 | 2, 278 | 2, 524 | 2, 985 | 8. 0 | 7. 0 | 11. 6 | 6. 0 |
| Denmark..... | 1, 053 | 1, 371 | 1, 384 | 1, 674 | 4. 2 | 4. 2 | 6. 4 | 3. 3 |
| Other Europe..... | 2, 175 | 3, 656 | 1, 617 | 6, 995 | 8. 7 | 11. 1 | 7. 4 | 14. 1 |
| Other countries..... | 993 | 1, 357 | 969 | 1, 216 | 4. 0 | 4. 2 | 4. 5 | 2. 4 |
| Apricots— | | | | | | | | |
| Total..... | 18, 132 | 17, 901 | 23, 684 | 24, 652 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 16, 221 | 15, 776 | 21, 158 | 22, 279 | 89. 5 | 88. 1 | 89. 3 | 90. 4 |
| Germany..... | 3, 946 | 4, 593 | 6, 512 | 7, 742 | 21. 8 | 25. 7 | 27. 5 | 31. 4 |
| United Kingdom..... | 2, 654 | 2, 084 | 1, 064 | 1, 422 | 14. 6 | 11. 6 | 8. 3 | 5. 8 |
| Netherlands..... | 4, 063 | 3, 316 | 4, 651 | 3, 750 | 22. 4 | 18. 5 | 19. 6 | 15. 2 |
| Norway..... | 568 | 945 | 1, 260 | 988 | 3. 1 | 5. 3 | 5. 3 | 4. 0 |
| Belgium..... | 1, 200 | 1, 038 | 1, 374 | 1, 691 | 6. 6 | 5. 8 | 5. 8 | 6. 9 |
| Sweden..... | 776 | 952 | 994 | 776 | 4. 3 | 5. 3 | 4. 2 | 3. 1 |
| Other Europe..... | 3, 014 | 2, 848 | 4, 403 | 5, 910 | 16. 7 | 15. 9 | 18. 6 | 24. 0 |
| Canada..... | 1, 132 | 1, 257 | 1, 920 | 1, 614 | 6. 2 | 7. 0 | 8. 1 | 6. 5 |
| Other countries..... | 779 | 868 | 606 | 759 | 4. 3 | 4. 9 | 2. 6 | 3. 1 |

See footnotes at end of table.

TABLE 498.—*Destination*
United States, 1926-1929—Continued *Exported from the*

| Article and country to which exported | Year ended June 30 | | | | | | | |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------|----------------------|----------------------|----------------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| VEGETABLE PRODUCTS—continued | | | | | | | | |
| Fruits—Continued. | | | | | | | | |
| Dried—Continued. | | | | | | | | |
| Prunes— | | | | | | | | |
| Total..... | 1,000 pounds 151,405 | 1,000 pounds 175,544 | 1,000 pounds 260,625 | 1,000 pounds 273,051 | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 |
| Total Europe..... | 125,278 | 145,710 | 223,574 | 240,794 | 82.7 | 83.0 | 85.8 | 88.2 |
| Germany..... | 18,893 | 38,553 | 79,732 | 77,883 | 12.5 | 22.0 | 30.6 | 28.5 |
| United Kingdom..... | 37,066 | 40,173 | 45,601 | 40,836 | 24.5 | 22.9 | 17.5 | 15.0 |
| France..... | 39,146 | 27,217 | 27,390 | 59,822 | 25.9 | 15.5 | 10.5 | 21.9 |
| Netherlands..... | 8,943 | 10,242 | 23,140 | 17,266 | 5.9 | 5.8 | 8.9 | 6.3 |
| Sweden..... | 4,871 | 6,854 | 7,047 | 5,434 | 3.2 | 3.9 | 2.7 | 2.0 |
| Other Europe..... | 16,329 | 22,671 | 40,664 | 39,533 | 10.7 | 12.9 | 15.6 | 14.5 |
| Canada..... | 17,723 | 20,454 | 23,272 | 18,965 | 11.7 | 11.7 | 8.9 | 6.9 |
| Other countries..... | 8,404 | 9,380 | 13,779 | 13,292 | 5.6 | 5.3 | 5.3 | 4.9 |
| Raisins— | | | | | | | | |
| Total..... | 135,027 | 152,337 | 193,099 | 221,756 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 83,706 | 97,714 | 131,925 | 152,785 | 62.0 | 64.1 | 68.3 | 68.9 |
| United Kingdom..... | 43,185 | 49,991 | 70,034 | 71,375 | 32.0 | 32.8 | 36.3 | 32.2 |
| Germany..... | 18,738 | 16,039 | 18,733 | 23,022 | 13.9 | 10.5 | 9.7 | 10.4 |
| Netherlands..... | 13,802 | 13,857 | 18,598 | 24,278 | 10.2 | 9.1 | 9.6 | 10.9 |
| Denmark..... | 2,107 | 1,994 | 1,593 | 2,244 | 1.6 | 1.3 | .8 | 1.0 |
| Other Europe..... | 5,874 | 15,833 | 22,067 | 31,866 | 4.3 | 10.4 | 11.9 | 14.4 |
| Canada..... | 32,914 | 37,400 | 40,148 | 39,635 | 24.4 | 24.6 | 20.8 | 17.9 |
| China..... | 4,406 | 3,549 | 4,144 | 7,574 | 3.3 | 2.3 | 2.1 | 3.4 |
| Japan..... | 2,513 | 2,801 | 3,086 | 2,961 | 1.9 | 1.8 | 1.6 | 1.3 |
| Other countries..... | 11,488 | 10,873 | 13,796 | 18,801 | 8.4 | 7.2 | 7.2 | 8.5 |
| Fresh— | | | | | | | | |
| Apples— | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels | | | | |
| Total..... | 1,851 | 4,483 | 1,349 | 3,005 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 1,678 | 4,154 | 1,184 | 2,786 | 90.7 | 92.7 | 87.8 | 92.7 |
| United Kingdom..... | 1,477 | 3,305 | 1,004 | 1,720 | 79.8 | 73.7 | 74.4 | 57.2 |
| Other Europe..... | 201 | 849 | 180 | 1,066 | 10.9 | 19.0 | 13.4 | 35.5 |
| Other countries..... | 173 | 329 | 165 | 219 | 9.3 | 7.3 | 12.2 | 7.3 |
| Apples— | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | | | | |
| Total..... | 5,464 | 7,844 | 5,384 | 12,027 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 3,993 | 6,142 | 4,025 | 10,057 | 73.1 | 78.3 | 74.8 | 83.6 |
| United Kingdom..... | 2,717 | 3,723 | 2,709 | 4,836 | 49.7 | 47.5 | 50.3 | 40.2 |
| Germany..... | 577 | 1,237 | 737 | 2,695 | 10.6 | 15.8 | 13.7 | 22.4 |
| Other Europe..... | 669 | 1,182 | 579 | 2,526 | 12.8 | 15.0 | 10.8 | 21.0 |
| Canada..... | 631 | 730 | 542 | 636 | 11.5 | 9.3 | 10.1 | 5.3 |
| Other countries..... | 840 | 972 | 817 | 1,334 | 15.4 | 12.4 | 15.1 | 11.1 |
| Oranges— | | | | | | | | |
| Total..... | 2,241 | 3,340 | 2,985 | 4,223 | 100.0 | 100.0 | 100.0 | 100.0 |
| Canada..... | 1,995 | 2,636 | 2,346 | 3,151 | 89.0 | 78.9 | 78.5 | 74.6 |
| United Kingdom..... | 114 | 403 | 402 | 709 | 5.1 | 12.1 | 13.5 | 16.8 |
| Other countries..... | 132 | 301 | 240 | 363 | 5.9 | 9.0 | 8.0 | 8.6 |
| Grapefruit— | | | | | | | | |
| Total..... | 379 | 613 | 719 | 940 | 100.0 | 100.0 | 100.0 | 100.0 |
| Canada..... | 227 | 264 | 349 | 335 | 59.9 | 43.1 | 48.5 | 35.6 |
| United Kingdom..... | 130 | 310 | 333 | 561 | 34.3 | 50.6 | 46.3 | 59.7 |
| France..... | 3 | 4 | 4 | 4 | .8 | .7 | .6 | .4 |
| Germany..... | 3 | 8 | 6 | 8 | .8 | 1.3 | .8 | .9 |
| Other countries..... | 16 | 27 | 27 | 32 | 4.2 | 4.3 | 3.8 | 3.4 |
| Canned— | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | | | |
| Total..... | 265,673 | 270,370 | 253,876 | 329,824 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 233,545 | 232,707 | 215,785 | 254,400 | 87.6 | 86.1 | 84.3 | 80.2 |
| United Kingdom..... | 207,792 | 203,016 | 177,256 | 236,754 | 77.9 | 75.1 | 69.3 | 71.8 |
| Other Europe..... | 25,843 | 29,691 | 38,529 | 47,646 | 9.7 | 11.0 | 15.0 | 14.4 |
| Canada..... | 11,149 | 15,491 | 17,993 | 22,709 | 4.2 | 5.7 | 7.0 | 6.9 |
| Other countries..... | 21,979 | 22,172 | 22,088 | 22,055 | 8.2 | 8.2 | 8.7 | 6.9 |

TABLE 498.—*Destination of principal agricultural products exported from the United States, 1926-1929—Continued*

| Article and country to which exported | Year ended June 30— | | | | | | | |
|---------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------|-------------------|-------------------|-------------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| VEGETABLE PRODUCTS—continued | | | | | | | | |
| Grains and grain products: | | | | | | | | |
| Barley— | | | | | | | | |
| Total..... | 1,000 bushels 27,181 | 1,000 bushels 17,044 | 1,000 bushels 36,580 | 1,000 bushels 56,996 | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 |
| Total Europe..... | 21,175 | 14,254 | 25,607 | 32,686 | 77.9 | 83.6 | 70.0 | 57.3 |
| United Kingdom..... | 13,223 | 8,981 | 10,151 | 13,161 | 48.6 | 52.7 | 27.8 | 23.1 |
| Germany..... | 3,883 | 2,066 | 11,599 | 13,085 | 14.3 | 12.1 | 31.7 | 23.0 |
| Netherlands..... | 922 | 815 | 2,581 | 3,909 | 3.4 | 4.8 | 7.1 | 6.9 |
| Belgium..... | 1,727 | 1,576 | 642 | 1,782 | 6.4 | 9.2 | 1.8 | 3.1 |
| Other Europe..... | 1,420 | 816 | 634 | 749 | 5.2 | 4.8 | 1.6 | 1.2 |
| Canada..... | 5,755 | 2,184 | 10,453 | 23,886 | 21.2 | 12.8 | 28.6 | 41.9 |
| Other countries..... | 251 | 606 | 520 | 424 | .9 | 3.6 | 1.4 | .8 |
| Corn— | | | | | | | | |
| Total..... | 23,137 | 17,563 | 18,374 | 40,750 | 100.0 | 100.0 | 100.0 | 100.0 |
| Canada..... | 8,071 | 10,536 | 6,454 | 11,082 | 34.9 | 60.0 | 35.1 | 27.2 |
| Cuba..... | 2,097 | 2,016 | 1,021 | 765 | 9.1 | 11.5 | 5.6 | 1.9 |
| Mexico..... | 4,453 | 2,124 | 323 | 572 | 19.2 | 12.0 | 1.8 | 1.4 |
| United Kingdom..... | 2,378 | 1,268 | 1,885 | 8,237 | 10.3 | 7.2 | 10.3 | 20.2 |
| Netherlands..... | 3,510 | 560 | 4,311 | 7,977 | 15.2 | 3.2 | 23.5 | 19.6 |
| Germany..... | 742 | 2 | 2,520 | 4,353 | 3.2 | .0 | 13.7 | 10.7 |
| Denmark..... | 999 | 563 | 845 | 896 | 4.3 | 3.1 | 4.6 | 2.2 |
| Other countries..... | 887 | 504 | 1,015 | 6,868 | 3.8 | 3.0 | 5.4 | 16.8 |
| Oats— | | | | | | | | |
| Total..... | 30,975 | 9,245 | 6,034 | 10,848 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 16,119 | 2,532 | 1,243 | 3,195 | 52.0 | 27.4 | 20.6 | 29.5 |
| Germany..... | 2,632 | 297 | 115 | 0 | 8.5 | 3.2 | 1.9 | .0 |
| United Kingdom..... | 4,563 | 1,259 | 645 | 1,177 | 14.7 | 13.6 | 10.7 | 10.8 |
| Belgium..... | 2,540 | 352 | 123 | 257 | 8.2 | 3.8 | 2.0 | 2.4 |
| France..... | 4,287 | 239 | 44 | 141 | 13.8 | 2.6 | .7 | 1.3 |
| Other Europe..... | 2,097 | 385 | 316 | 1,620 | 6.8 | 4.2 | 5.3 | 15.0 |
| Canada..... | 13,351 | 5,198 | 3,426 | 6,501 | 43.1 | 56.2 | 56.8 | 59.9 |
| Cuba..... | 1,093 | 1,170 | 1,028 | 861 | 3.5 | 12.7 | 17.0 | 7.9 |
| Mexico..... | 127 | 132 | 98 | 51 | .4 | 1.4 | 1.6 | .5 |
| Other countries..... | 285 | 213 | 239 | 240 | 1.0 | 2.3 | 4.0 | 2.2 |
| Oatmeal— | | | | | | | | |
| Total..... | 1,000 pounds 156,805 | 1,000 pounds 104,334 | 1,000 pounds 68,192 | 1,000 pounds 97,245 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 130,684 | 74,806 | 39,749 | 67,948 | 83.3 | 71.7 | 58.3 | 69.9 |
| United Kingdom..... | 46,526 | 18,885 | 14,447 | 23,775 | 29.7 | 18.1 | 21.2 | 24.4 |
| Netherlands..... | 31,843 | 25,930 | 7,485 | 14,525 | 20.3 | 24.9 | 11.0 | 14.9 |
| Finland..... | 17,532 | 13,219 | 9,471 | 17,335 | 11.2 | 12.7 | 13.9 | 17.8 |
| Belgium..... | 7,057 | 4,736 | 2,890 | 3,064 | 4.5 | 4.5 | 4.2 | 3.2 |
| Other Europe..... | 27,726 | 12,036 | 5,456 | 9,249 | 17.6 | 11.5 | 8.0 | 9.6 |
| South America..... | 3,768 | 1,164 | 9,757 | 11,389 | 2.4 | 1.1 | 14.3 | 11.7 |
| Mexico..... | 3,993 | 4,027 | 3,739 | 3,802 | 2.5 | 3.9 | 5.5 | 3.9 |
| British India..... | 804 | 850 | 1,770 | 1,594 | .5 | .8 | 2.6 | 1.6 |
| Canada..... | 3,265 | 1,913 | 3,582 | 1,556 | 2.1 | 1.8 | 5.3 | 1.6 |
| Other countries..... | 14,291 | 21,574 | 9,595 | 10,956 | 9.2 | 20.7 | 14.0 | 11.3 |
| Rice— | | | | | | | | |
| Total..... | 27,588 | 234,548 | 230,432 | 313,405 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 16,467 | 121,914 | 133,819 | 173,117 | 59.7 | 52.0 | 58.1 | 55.2 |
| United Kingdom..... | 8,071 | 33,675 | 35,459 | 41,812 | 29.3 | 14.4 | 15.4 | 13.3 |
| Belgium..... | 2,452 | 18,764 | 12,778 | 23,167 | 8.9 | 8.0 | 5.5 | 7.4 |
| Germany..... | 3,417 | 36,917 | 35,851 | 43,799 | 12.4 | 15.7 | 15.6 | 14.0 |
| France..... | 273 | 5,169 | 12,388 | 16,065 | 1.0 | 2.2 | 5.4 | 5.1 |
| Other Europe..... | 2,254 | 27,389 | 37,343 | 48,274 | 8.1 | 11.7 | 10.2 | 15.4 |
| South America..... | 3,315 | 24,847 | 41,205 | 78,819 | 12.0 | 10.6 | 17.9 | 25.1 |
| Canada..... | 918 | 7,525 | 14,227 | 19,800 | 3.3 | 3.2 | 6.2 | 6.3 |
| Central America..... | 2,302 | 3,408 | 5,888 | 5,852 | 8.3 | 1.5 | 2.6 | 1.9 |
| Japan..... | 436 | 68,518 | 2,020 | 14,609 | 1.6 | 29.2 | .9 | 4.7 |
| Other countries..... | 4,150 | 8,276 | 33,273 | 21,208 | 15.1 | 3.5 | 14.3 | 6.8 |

TABLE 498.—*Destination of principal agricultural products exported from the United States, 1926-1929—Continued*

| Article and country to which exported | Year ended June 30— | | | | | | | |
|---|---------------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| VEGETABLE PRODUCTS—continued | | | | | | | | |
| Grains and grain products—Contd. | | | | | | | | |
| Rye— | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 |
| Total..... | 12,505 | 21,613 | 26,064 | 9,346 | | | | |
| Total Europe..... | 5,466 | 7,485 | 5,974 | 3,381 | 43.7 | 34.6 | 22.9 | 36.2 |
| Germany..... | 1,179 | 1,577 | 1,245 | 364 | 9.4 | 7.3 | 4.8 | 3.9 |
| Netherlands..... | 1,234 | 1,708 | 1,408 | 868 | 9.9 | 8.2 | 5.4 | 9.3 |
| Norway..... | 1,499 | 489 | 268 | 57 | 12.0 | 2.3 | 1.1 | .6 |
| United Kingdom..... | 330 | 2,345 | 1,710 | 1,174 | 2.6 | 10.8 | 6.6 | 12.6 |
| Other Europe..... | 1,224 | 1,306 | 1,313 | 918 | 9.8 | 6.0 | 5.0 | 9.8 |
| Canada..... | 7,017 | 14,118 | 20,080 | 5,913 | 56.1 | 65.3 | 77.0 | 63.3 |
| Other countries..... | 22 | 10 | 9 | 52 | .2 | .1 | .1 | .5 |
| Wheat— | | | | | | | | |
| Total..... | 63,189 | 156,250 | 145,990 | 103,114 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 33,893 | 111,198 | 89,203 | 46,645 | 53.6 | 71.2 | 61.1 | 45.2 |
| United Kingdom..... | 16,335 | 39,341 | 36,574 | 10,276 | 25.9 | 25.2 | 25.1 | 15.8 |
| Italy..... | 2,877 | 10,407 | 10,450 | 5,047 | 4.6 | 6.7 | 7.2 | 4.9 |
| Netherlands..... | 3,720 | 17,131 | 11,559 | 5,149 | 5.9 | 11.0 | 7.9 | 5.0 |
| Belgium..... | 4,302 | 8,926 | 8,797 | 3,232 | 6.8 | 5.7 | 6.0 | 3.1 |
| France..... | 613 | 16,079 | 5,127 | 2,215 | 1.0 | 10.3 | 3.5 | 2.1 |
| Germany..... | 1,704 | 7,287 | 5,582 | 1,674 | 2.7 | 4.7 | 3.8 | 1.6 |
| Other Europe..... | 4,342 | 12,027 | 11,114 | 13,052 | 6.7 | 7.6 | 7.6 | 12.7 |
| Canada..... | 20,638 | 26,793 | 45,563 | 41,190 | 32.7 | 17.1 | 31.2 | 39.9 |
| Japan, including Chosen..... | 5,178 | 7,336 | 6,304 | 3,782 | 8.2 | 4.7 | 4.3 | 3.7 |
| China..... | 17 | 1,099 | 0 | 1,241 | .0 | .7 | .0 | 1.2 |
| Other countries..... | 3,463 | 9,824 | 4,929 | 10,256 | 5.5 | 6.3 | 3.4 | 10.0 |
| Wheat, flour— | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels | | | | |
| Total..... | 9,542 | 13,385 | 12,821 | 12,888 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 3,121 | 6,063 | 5,093 | 3,708 | 32.7 | 45.3 | 39.7 | 28.8 |
| United Kingdom..... | 860 | 1,733 | 1,224 | 886 | 9.0 | 12.9 | 9.5 | 6.9 |
| Germany..... | 340 | 834 | 534 | 312 | 3.6 | 6.2 | 4.2 | 2.4 |
| Netherlands..... | 774 | 1,568 | 1,530 | 1,084 | 8.1 | 11.7 | 11.9 | 8.4 |
| Greece..... | 249 | 282 | 113 | 49 | 2.6 | 2.1 | .9 | .4 |
| Other Europe..... | 898 | 1,646 | 1,692 | 1,377 | 9.4 | 12.4 | 13.2 | 10.7 |
| Cuba..... | 1,144 | 1,199 | 1,216 | 1,204 | 12.0 | 9.0 | 9.5 | 9.3 |
| Other West Indies..... | 607 | 747 | 676 | 809 | 6.4 | 5.6 | 5.3 | 6.3 |
| Brazil..... | 864 | 904 | 873 | 831 | 9.1 | 6.8 | 6.8 | 6.4 |
| Philippine Islands..... | 596 | 666 | 727 | 802 | 6.2 | 5.0 | 5.7 | 6.2 |
| Central America..... | 561 | 613 | 697 | 752 | 5.9 | 4.6 | 5.4 | 5.8 |
| Hongkong..... | 371 | 618 | 929 | 868 | 3.9 | 4.6 | 7.2 | 6.7 |
| China..... | 469 | 418 | 790 | 1,242 | 5.1 | 3.1 | 6.2 | 9.6 |
| Kwantung..... | 266 | 189 | 136 | 428 | 2.8 | 1.4 | 1.1 | 3.3 |
| Other countries..... | 1,523 | 1,967 | 1,684 | 2,244 | 15.9 | 14.6 | 13.1 | 17.6 |
| Hops— | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | | | |
| Total..... | 14,998 | 13,369 | 11,812 | 8,836 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 10,537 | 9,378 | 7,718 | 5,337 | 70.3 | 70.1 | 65.3 | 60.4 |
| United Kingdom..... | 4,115 | 4,559 | 6,121 | 4,175 | 27.4 | 34.1 | 51.8 | 47.2 |
| Belgium..... | 3,791 | 1,892 | 255 | 129 | 25.3 | 14.2 | 2.2 | 1.5 |
| Other Europe..... | 2,631 | 2,927 | 1,342 | 1,033 | 17.6 | 21.8 | 11.3 | 11.7 |
| Canada..... | 2,937 | 2,772 | 3,168 | 2,838 | 19.6 | 20.7 | 26.8 | 32.1 |
| Other countries..... | 1,524 | 1,219 | 926 | 661 | 10.1 | 9.2 | 7.9 | 7.5 |
| Oil cake and oil-cake meal— | | | | | | | | |
| Cottonseed cake— | | | | | | | | |
| Total..... | 506,582 | 599,448 | 527,023 | 395,257 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 505,701 | 585,526 | 526,913 | 395,230 | 99.8 | 97.7 | 100.0 | 100.0 |
| Denmark..... | 408,114 | 345,747 | 450,524 | 319,596 | 80.6 | 57.7 | 85.5 | 80.9 |
| Germany..... | 73,489 | 215,887 | 58,773 | 49,844 | 14.5 | 36.0 | 11.2 | 12.6 |
| Other Europe..... | 24,098 | 23,892 | 17,611 | 25,790 | 4.7 | 4.0 | 3.3 | 6.5 |
| Other countries..... | 881 | 13,922 | 110 | 27 | .2 | 2.3 | .0 | .0 |

See footnotes at end of table.

TABLE 498.—*Destination of principal agricultural products exported from the United States, 1926-1929—Continued*

| Article and country to which exported | Year ended June 30— | | | | | | | |
|---------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------|----------------------|----------------------|----------------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| VEGETABLE PRODUCTS—continued | | | | | | | | |
| Grains and grain products—Contd. | | | | | | | | |
| Oil cake and oil-cake meal—Con. | | | | | | | | |
| Cottonseed meal— | | | | | | | | |
| Total..... | 1,000 pounds 209,922 | 1,000 pounds 391,068 | 1,000 pounds 137,498 | 1,000 pounds 177,415 | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 |
| Total Europe..... | 191,216 | 360,620 | 126,758 | 162,739 | 91.1 | 92.2 | 92.2 | 91.7 |
| United Kingdom..... | 91,867 | 150,690 | 45,844 | 60,084 | 43.8 | 38.5 | 33.3 | 33.9 |
| Germany..... | 47,013 | 127,687 | 39,157 | 46,312 | 22.4 | 32.7 | 28.5 | 26.1 |
| Norway..... | 17,768 | 28,746 | 11,655 | 10,192 | 8.5 | 7.4 | 8.5 | 5.7 |
| Other Europe..... | 34,568 | 53,488 | 30,102 | 46,151 | 16.4 | 13.6 | 21.9 | 26.0 |
| Other countries..... | 18,706 | 30,448 | 10,740 | 14,676 | 8.9 | 7.8 | 7.8 | 8.3 |
| Linseed or flaxseed cake— | | | | | | | | |
| Total..... | 577,908 | 609,520 | 589,174 | 624,913 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 577,891 | 609,394 | 589,053 | 624,086 | 100.0 | 100.0 | 100.0 | 99.9 |
| Netherlands..... | 416,202 | 381,104 | 305,321 | 371,385 | 72.0 | 62.5 | 51.8 | 59.4 |
| Belgium..... | 125,301 | 171,487 | 235,883 | 204,205 | 21.7 | 28.1 | 40.0 | 32.7 |
| United Kingdom..... | 26,513 | 45,522 | 38,698 | 40,392 | 4.6 | 7.5 | 6.6 | 6.5 |
| Other Europe..... | 9,875 | 11,281 | 9,151 | 8,104 | 1.7 | 1.9 | 1.6 | 1.3 |
| Other countries..... | 17 | 126 | 121 | 827 | .0 | .0 | .0 | .1 |
| Oils, vegetable: | | | | | | | | |
| Cottonseed— | | | | | | | | |
| Total..... | 59,016 | 57,580 | 61,470 | 29,531 | 100.0 | 100.0 | 100.0 | 100.0 |
| Canada..... | 36,387 | 37,683 | 49,407 | 20,550 | 61.7 | 65.4 | 80.4 | 60.6 |
| Cuba..... | 4,869 | 2,770 | 2,033 | 1,836 | 8.3 | 4.8 | 3.3 | 6.2 |
| Mexico..... | 4,362 | 3,808 | 5,318 | 2,374 | 7.4 | 6.7 | 8.7 | 8.0 |
| Germany..... | 288 | 747 | 42 | 14 | .5 | 1.3 | .1 | .0 |
| Norway..... | 1,565 | 2,325 | 131 | 0 | 2.7 | 4.0 | .2 | .0 |
| Argentina..... | 1,536 | 2,160 | 1,108 | 912 | 2.6 | 3.8 | 1.8 | 3.1 |
| Other countries..... | 10,009 | 8,027 | 3,431 | 3,845 | 16.8 | 14.0 | 5.5 | 13.1 |
| Sugar, refined: | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | | | | |
| Total..... | 300 | 114 | 106 | 128 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 217 | 67 | 61 | 46 | 72.3 | 58.8 | 57.5 | 35.9 |
| United Kingdom..... | 131 | 37 | 35 | 24 | 43.7 | 32.5 | 33.0 | 18.8 |
| France..... | 12 | 5 | 1 | 2 | 4.0 | 4.4 | .9 | 1.6 |
| Greece..... | 7 | 3 | 2 | 0 | 2.3 | 2.6 | 1.9 | .0 |
| Norway..... | 27 | 15 | 13 | 14 | 9.0 | 13.2 | 12.3 | 10.9 |
| Other Europe..... | 40 | 7 | 10 | 6 | 13.3 | 6.1 | 9.4 | 4.6 |
| Uruguay..... | 33 | 19 | 13 | 26 | 11.0 | 16.7 | 12.3 | 20.3 |
| Canada..... | 5 | 2 | 4 | 7 | 1.7 | 1.8 | 3.8 | 5.5 |
| Newfoundland and Labrador..... | 4 | 1 | 1 | 2 | 1.3 | .9 | .0 | 1.6 |
| West Indies and Bermuda..... | 5 | 4 | 5 | 6 | 1.7 | 3.5 | 4.7 | 4.7 |
| British Africa..... | 4 | 5 | 5 | 12 | 1.3 | 4.4 | 4.7 | 9.4 |
| Mexico..... | 2 | 4 | 2 | 5 | .7 | 3.5 | 1.9 | 3.0 |
| Other countries..... | 30 | 12 | 15 | 24 | 10.0 | 10.4 | 14.2 | 18.7 |
| Tobacco, leaf: | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | | | |
| Bright flue cured— | | | | | | | | |
| Total..... | 324,363 | 288,671 | 328,924 | 414,366 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 176,662 | 163,744 | 192,081 | 211,358 | 54.5 | 56.7 | 58.4 | 51.0 |
| United Kingdom..... | 153,540 | 134,886 | 157,506 | 171,352 | 47.3 | 46.7 | 47.9 | 41.4 |
| Germany..... | 9,789 | 11,105 | 13,378 | 13,801 | 3.0 | 3.8 | 4.1 | 3.3 |
| Other Europe..... | 13,333 | 17,753 | 21,197 | 26,205 | 4.2 | 6.2 | 6.4 | 6.3 |
| China..... | 93,627 | 71,760 | 68,842 | 131,254 | 28.9 | 24.9 | 20.9 | 31.7 |
| Australia..... | 20,306 | 19,307 | 21,488 | 18,146 | 6.3 | 6.7 | 6.5 | 4.4 |
| Canada..... | 11,568 | 11,984 | 14,049 | 14,293 | 3.6 | 4.2 | 4.3 | 3.4 |
| Japan..... | 8,203 | 8,553 | 11,555 | 14,564 | 2.5 | 3.0 | 3.5 | 3.5 |
| British India..... | 5,599 | 4,538 | 5,031 | 5,884 | 1.7 | 1.6 | 1.5 | 1.4 |
| Other countries..... | 8,398 | 8,785 | 15,878 | 18,867 | 2.5 | 2.9 | 4.9 | 4.6 |

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1927-1929, and official records of the Bureau of Foreign and Domestic Commerce.

¹ Excludes Bermuda.

² Includes Hong Kong and Kwantung.

TABLE 499.—Principal agricultural products imported into the United States, by countries, 1926-1929

| Article and country from which imported | Year ended June 30— | | | | | | | |
|---|---------------------|---------------|--------------|---------------|------------|------------|------------|------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| ANIMALS AND ANIMAL PRODUCTS | | | | | | | | |
| Cattle: | Thou- | Thou- | Thou- | Thou- | Per | Per | Per | Per |
| Total..... | sands 215 | sands 267 | sands 548 | sands 566 | cent 100.0 | cent 100.0 | cent 100.0 | cent 100.0 |
| Canada..... | 175 | 168 | 343 | 256 | 81.4 | 62.9 | 62.6 | 45.2 |
| Mexico..... | 39 | 99 | 204 | 309 | 18.1 | 37.1 | 37.2 | 54.6 |
| Other countries..... | 1 | 0 | 1 | 1 | .5 | .0 | .2 | .2 |
| Butter: | 1,000 | 1,000 | 1,000 | 1,000 | | | | |
| Total..... | pounds 6,440 | pounds 10,710 | pounds 4,955 | pounds 3,298 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 1,754 | 5,653 | 2,084 | 1,239 | 27.2 | 52.8 | 42.1 | 37.6 |
| Denmark..... | 873 | 1,529 | 761 | 902 | 13.6 | 14.3 | 15.4 | 27.3 |
| United Kingdom..... | 691 | 3,932 | 870 | 58 | 10.7 | 36.7 | 17.6 | 1.8 |
| Other Europe..... | 190 | 192 | 453 | 279 | 2.9 | 1.8 | 9.1 | 8.5 |
| Canada..... | 1,111 | 610 | 275 | 237 | 17.3 | 5.7 | 5.5 | 7.2 |
| New Zealand..... | 2,232 | 3,682 | 2,396 | 1,674 | 34.7 | 34.4 | 48.4 | 50.8 |
| Argentina..... | 1,147 | 332 | 11 | 62 | 17.8 | 3.1 | .2 | 1.9 |
| Other countries..... | 196 | 433 | 189 | 86 | 3.0 | 4.0 | 3.8 | 2.5 |
| Cheese: | | | | | | | | |
| Total..... | 62,412 | 89,782 | 75,424 | 84,606 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 61,859 | 72,454 | 63,374 | 73,888 | 99.1 | 80.7 | 84.0 | 87.3 |
| Italy..... | 33,822 | 36,572 | 31,332 | 38,337 | 54.2 | 40.7 | 41.5 | 45.3 |
| Switzerland..... | 15,487 | 20,638 | 16,449 | 19,731 | 24.8 | 23.0 | 21.8 | 23.3 |
| France..... | 5,855 | 4,923 | 5,874 | 6,243 | 9.4 | 5.5 | 7.8 | 7.4 |
| Netherlands..... | 3,056 | 3,687 | 3,736 | 3,525 | 4.9 | 4.1 | 5.0 | 4.2 |
| Other Europe..... | 3,639 | 6,634 | 5,983 | 6,052 | 5.8 | 7.4 | 7.9 | 7.1 |
| Canada..... | 164 | 16,609 | 11,439 | 9,381 | .3 | 18.5 | 15.2 | 11.1 |
| Other countries..... | 389 | 719 | 611 | 1,337 | .6 | .8 | .8 | 1.6 |
| Eggs, in the shell: | 1,000 | 1,000 | 1,000 | 1,000 | | | | |
| Total..... | dozen 276 | dozen 296 | dozen 256 | dozen 291 | 100.0 | 100.0 | 100.0 | 100.0 |
| Hong Kong..... | 189 | 219 | 199 | 236 | 68.5 | 74.0 | 77.7 | 81.1 |
| China..... | 16 | 6 | 40 | 28 | 5.8 | 2.0 | 15.6 | 9.6 |
| Canada..... | 69 | 54 | 13 | 13 | 25.0 | 18.2 | 5.1 | 4.5 |
| Other countries..... | 2 | 17 | 4 | 14 | .7 | 5.8 | 1.6 | 4.8 |
| Eggs and egg yolks (dried, frozen, and preserved): | 1,000 | 1,000 | 1,000 | 1,000 | | | | |
| Total..... | pounds 25,670 | pounds 18,315 | pounds 5,901 | pounds 24,460 | 100.0 | 100.0 | 100.0 | 100.0 |
| China..... | 21,928 | 14,825 | 5,409 | 20,582 | 85.4 | 80.9 | 91.7 | 84.1 |
| United Kingdom..... | 3,130 | 3,357 | 248 | 3,285 | 12.2 | 18.3 | 4.2 | 13.4 |
| Other countries..... | 621 | 133 | 244 | 593 | 2.4 | .8 | 4.1 | 2.5 |
| Egg albumen: | | | | | | | | |
| Total..... | 9,610 | 7,826 | 2,914 | 3,508 | 100.0 | 100.0 | 100.0 | 100.0 |
| China..... | 8,676 | 6,907 | 2,836 | 3,431 | 90.3 | 88.3 | 97.3 | 97.8 |
| Other countries..... | 934 | 919 | 78 | 77 | 9.7 | 11.7 | 2.7 | 2.2 |
| Fibers, animal: | | | | | | | | |
| Silk, raw, in skeins reeled from cocoon— | | | | | | | | |
| Total..... | 64,291 | 73,402 | 75,758 | 77,341 | 100.0 | 100.0 | 100.0 | 100.0 |
| Japan..... | 51,784 | 59,934 | 64,673 | 63,415 | 80.5 | 81.6 | 85.4 | 82.0 |
| China..... | 9,519 | 11,872 | 9,816 | 12,326 | 14.8 | 16.2 | 13.0 | 15.9 |
| Other countries..... | 2,988 | 1,596 | 1,269 | 1,600 | 4.7 | 2.2 | 1.6 | 2.1 |
| Wool, unmanufactured— | | | | | | | | |
| Carpet wool— | | | | | | | | |
| Total..... | 118,079 | 144,698 | 145,489 | 164,713 | 100.0 | 100.0 | 100.0 | 100.0 |
| China..... | 35,668 | 36,262 | 55,998 | 53,589 | 30.2 | 25.1 | 38.5 | 32.5 |
| United Kingdom..... | 39,143 | 51,602 | 32,423 | 33,861 | 33.2 | 35.7 | 22.3 | 20.6 |
| British India..... | 6,804 | 6,906 | 10,811 | 14,390 | 5.8 | 4.8 | 7.4 | 8.7 |
| Palestine and Syria..... | 7,691 | 8,064 | 8,420 | 3,953 | 6.5 | 5.6 | 5.8 | 2.4 |
| Argentina..... | 6,885 | 9,513 | 8,924 | 19,820 | 5.8 | 6.6 | 6.1 | 12.0 |
| France..... | 2,945 | 5,371 | 5,414 | 4,470 | 2.5 | 3.7 | 3.7 | 2.7 |
| Other countries..... | 18,933 | 26,880 | 23,499 | 34,639 | 16.0 | 18.5 | 16.2 | 21.1 |

TABLE 499.—Principal agricultural products imported into the United States, by countries, 1926-1929—Continued

| Article and country from which imported | Year ended June 30— | | | | | | | |
|---|---------------------|--------------|--------------|--------------|----------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| ANIMALS AND ANIMAL PRODUCTS—continued | | | | | | | | |
| Fibers, animal—Continued. | | | | | | | | |
| Wool, unmanufactured—Contd. | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 | Per cent 100.0 |
| Clothing wool— | | | | | | | | |
| Total..... | 16,663 | 16,770 | 19,374 | 18,407 | | | | |
| Argentina..... | 2,730 | 2,843 | 2,545 | 1,872 | 16.4 | 17.0 | 13.1 | 10.2 |
| United Kingdom..... | 4,152 | 4,775 | 4,169 | 2,499 | 24.9 | 28.5 | 21.5 | 13.6 |
| Uruguay..... | 1,016 | 497 | 213 | 1,062 | 6.1 | 3.0 | 1.1 | 5.8 |
| Australia..... | 4,560 | 3,797 | 5,515 | 5,936 | 27.4 | 22.6 | 28.5 | 32.2 |
| Chile..... | 728 | 1,186 | 1,677 | 1,625 | 4.4 | 7.1 | 8.7 | 8.8 |
| Canada..... | 843 | 2,353 | 2,838 | 1,601 | 5.0 | 14.0 | 14.6 | 8.7 |
| Other countries..... | 2,634 | 1,319 | 2,417 | 3,812 | 15.8 | 7.8 | 12.5 | 20.7 |
| Combing wool— | | | | | | | | |
| Total..... | 204,032 | 102,908 | 80,282 | 83,478 | 100.0 | 100.0 | 100.0 | 100.0 |
| Australia..... | 59,531 | 38,714 | 21,992 | 17,906 | 29.2 | 37.6 | 27.4 | 21.4 |
| United Kingdom..... | 27,314 | 15,484 | 17,344 | 12,319 | 13.4 | 15.0 | 21.6 | 14.8 |
| Argentina..... | 37,292 | 15,265 | 11,424 | 12,875 | 18.3 | 14.8 | 14.2 | 15.4 |
| Uruguay..... | 37,592 | 17,751 | 6,962 | 20,341 | 18.4 | 17.2 | 8.7 | 24.4 |
| New Zealand..... | 16,442 | 5,192 | 8,260 | 8,577 | 8.0 | 5.0 | 10.3 | 10.3 |
| Other countries..... | 25,861 | 10,502 | 14,300 | 11,460 | 12.7 | 10.4 | 17.8 | 13.7 |
| Hair of the Angora goat (mohair), alpaca, etc.— | | | | | | | | |
| Total..... | 6,738 | 6,752 | 2,890 | 4,338 | 100.0 | 100.0 | 100.0 | 100.0 |
| British South Africa..... | 2,319 | 2,505 | 660 | 884 | 34.4 | 37.1 | 22.8 | 20.4 |
| United Kingdom..... | 2,530 | 792 | 541 | 384 | 37.5 | 11.7 | 18.7 | 8.9 |
| Peru..... | 85 | 82 | 425 | 716 | 1.3 | 1.2 | 14.7 | 16.5 |
| China..... | 55 | 74 | 184 | 145 | .8 | 1.1 | 6.4 | 3.3 |
| Turkey (Europe and Asia)..... | 1,731 | 3,237 | 983 | 2,034 | 25.7 | 47.9 | 34.0 | 46.9 |
| Other countries..... | 18 | 62 | 97 | 175 | .3 | 1.0 | 3.4 | 4.0 |
| Sausage casings: | | | | | | | | |
| Total..... | 19,271 | 18,844 | 19,545 | 22,040 | 100.0 | 100.0 | 100.0 | 100.0 |
| Argentina..... | 4,690 | 4,804 | 4,975 | 5,719 | 24.3 | 25.5 | 25.5 | 26.0 |
| Canada..... | 3,715 | 3,351 | 3,928 | 2,989 | 19.3 | 17.8 | 20.1 | 13.6 |
| China..... | 2,989 | 2,074 | 1,640 | 1,445 | 15.5 | 11.0 | 8.4 | 6.6 |
| Australia..... | 2,109 | 2,198 | 2,213 | 2,597 | 10.9 | 11.7 | 11.3 | 11.8 |
| Uruguay..... | 501 | 876 | 917 | 1,317 | 2.6 | 4.6 | 4.7 | 6.0 |
| New Zealand..... | 1,357 | 901 | 1,223 | 1,086 | 7.0 | 4.8 | 6.3 | 4.9 |
| Germany..... | 784 | 1,904 | 1,353 | 2,599 | 4.1 | 10.1 | 6.9 | 11.8 |
| Other countries..... | 3,126 | 2,736 | 3,296 | 4,288 | 16.3 | 14.5 | 16.8 | 19.3 |
| VEGETABLE PRODUCTS | | | | | | | | |
| Cocoa or cacao beans: | | | | | | | | |
| Total..... | 417,060 | 425,184 | 411,543 | 410,243 | 100.0 | 100.0 | 100.0 | 100.0 |
| British West Africa..... | 135,051 | 164,338 | 133,963 | 140,739 | 32.4 | 38.7 | 32.6 | 35.0 |
| Brazil..... | 86,110 | 81,148 | 100,262 | 87,338 | 20.6 | 19.1 | 24.4 | 20.8 |
| Dominican Republic..... | 49,955 | 61,084 | 39,591 | 50,353 | 12.0 | 12.0 | 9.6 | 12.0 |
| British West Indies and Bermudas..... | 40,061 | 31,247 | 38,217 | 41,933 | 11.0 | 7.3 | 9.3 | 10.0 |
| Ecuador..... | 34,385 | 13,710 | 19,210 | 16,939 | 8.2 | 3.2 | 4.7 | 4.0 |
| Venezuela..... | 15,046 | 13,207 | 14,482 | 18,008 | 3.6 | 3.1 | 3.5 | 4.3 |
| Germany..... | 11,479 | 15,797 | 29,074 | 17,424 | 2.8 | 3.7 | 7.1 | 4.2 |
| Other countries..... | 38,973 | 54,653 | 36,744 | 40,509 | 9.4 | 12.9 | 8.8 | 9.7 |
| Coffee: | | | | | | | | |
| Total..... | 1,437,364 | 1,444,847 | 1,535,392 | 1,435,070 | 100.0 | 100.0 | 100.0 | 100.0 |
| Brazil..... | 995,957 | 1,000,721 | 1,059,742 | 933,056 | 69.3 | 69.3 | 69.0 | 65.0 |
| Colombia..... | 207,469 | 313,590 | 261,678 | 263,236 | 14.4 | 21.7 | 17.0 | 18.3 |
| Central America..... | 84,812 | 40,070 | 64,443 | 54,774 | 6.6 | 2.8 | 4.2 | 3.8 |
| Other countries..... | 139,126 | 90,466 | 140,529 | 184,004 | 9.7 | 6.2 | 9.8 | 12.9 |

TABLE 499.—Principal agricultural products imported into the United States, by countries, 1926-1929—Continued

| Article and country from which imported | Year ended June 30— | | | | | | | |
|---|---------------------|---------------|---------------|---------------|----------|----------|----------|----------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| VEGETABLE PRODUCTS—continued | | | | | | | | |
| Fibers, vegetable: | | | | | | | | |
| Cotton, raw— | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | Per cent | Per cent | Per cent | Per cent |
| Total..... | 161, 453 | 190, 963 | 175, 450 | 227, 454 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Egypt..... | 112, 633 | 102, 280 | 94, 581 | 135, 007 | 69. 8 | 53. 6 | 53. 9 | 59. 4 |
| Mexico..... | 11, 776 | 46, 550 | 11, 508 | 26, 004 | 7. 3 | 24. 4 | 6. 6 | 11. 4 |
| China..... | 12, 787 | 14, 536 | 32, 123 | 18, 554 | 7. 9 | 7. 6 | 18. 3 | 8. 2 |
| British India..... | 11, 123 | 9, 240 | 12, 467 | 25, 736 | 6. 9 | 4. 8 | 7. 1 | 11. 3 |
| Peru..... | 7, 469 | 8, 650 | 9, 146 | 8, 636 | 4. 6 | 4. 5 | 5. 2 | 3. 8 |
| Other countries..... | 5, 665 | 9, 707 | 15, 625 | 13, 517 | 3. 5 | 5. 1 | 8. 9 | 5. 9 |
| Flax, unmanufactured— | Long tons | Long tons | Long tons | Long tons | | | | |
| Total..... | 7, 104 | 4, 705 | 5, 437 | 5, 650 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 6, 543 | 4, 294 | 5, 187 | 5, 476 | 92. 1 | 91. 3 | 95. 4 | 96. 9 |
| United Kingdom..... | 1, 759 | 1, 231 | 1, 800 | 1, 758 | 24. 8 | 26. 2 | 33. 1 | 31. 1 |
| Belgium..... | 630 | 446 | 739 | 757 | 8. 9 | 9. 5 | 13. 6 | 13. 4 |
| Latvia..... | 215 | 898 | 1, 520 | 2, 176 | 3. 0 | 19. 1 | 28. 0 | 38. 5 |
| Russia in Europe..... | 1, 565 | 642 | 149 | 294 | 22. 0 | 13. 6 | 2. 7 | 5. 2 |
| Netherlands..... | 439 | 287 | 253 | 208 | 6. 2 | 6. 1 | 4. 7 | 3. 7 |
| Estonia..... | 1, 126 | 566 | 113 | 0 | 15. 8 | 12. 0 | 2. 1 | . 0 |
| Other Europe..... | 809 | 224 | 613 | 283 | 11. 4 | 4. 8 | 11. 2 | 5. 0 |
| Canada..... | 263 | 45 | 126 | 72 | 3. 7 | 1. 0 | 2. 3 | 1. 3 |
| Other countries..... | 298 | 366 | 124 | 102 | 4. 2 | 7. 7 | 2. 3 | 1. 8 |
| Manila fiber— | | | | | | | | |
| Total..... | 62 | 61 | 48 | 60 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Philippine Islands..... | 62 | 60 | 47 | 60 | 100. 0 | 98. 4 | 97. 9 | 100. 0 |
| Other countries..... | 0 | 1 | 1 | 0 | . 0 | 1. 6 | 2. 1 | . 0 |
| Sisal and henequen— | | | | | | | | |
| Total..... | 126 | 116 | 124 | 135 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Mexico..... | 96 | 82 | 93 | 95 | 76. 2 | 70. 7 | 75. 0 | 70. 4 |
| Dutch East Indies..... | 14 | 19 | 16 | 20 | 11. 1 | 16. 4 | 12. 9 | 14. 8 |
| Other countries..... | 16 | 15 | 15 | 20 | 12. 7 | 12. 9 | 12. 1 | 14. 8 |
| Fruits: | | | | | | | | |
| Dried— | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | | | |
| Currants— | 14, 773 | 13, 011 | 11, 034 | 9, 382 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total..... | 14, 773 | 13, 011 | 11, 034 | 9, 382 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total Europe..... | 14, 635 | 12, 013 | 10, 856 | 9, 286 | 99. 1 | 99. 2 | 98. 4 | 99. 0 |
| Greece..... | 14, 032 | 12, 714 | 10, 800 | 9, 178 | 95. 0 | 97. 7 | 97. 9 | 97. 8 |
| Other Europe..... | 603 | 199 | 56 | 108 | 4. 1 | 1. 5 | . 5 | 1. 2 |
| Other countries..... | 138 | 98 | 178 | 96 | . 9 | . 8 | 1. 6 | 1. 0 |
| Dates— | | | | | | | | |
| Total..... | 70, 195 | 49, 434 | 44, 128 | 54, 087 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Hejaz, Arabia, etc..... | 59, 623 | 32, 828 | 694 | 478 | 84. 9 | 66. 4 | 1. 6 | . 9 |
| United Kingdom..... | 5, 800 | 3, 413 | 6, 987 | 3, 085 | 8. 3 | 6. 9 | 15. 8 | 5. 7 |
| Palestine and Syria..... | 0 | 0 | 37 | 0 | . 0 | 0 | 0 | 0 |
| Iraq..... | 1, 942 | 10, 161 | 34, 700 | 45, 373 | 11. 3 | 20. 6 | 78. 6 | 83. 9 |
| Other countries..... | 3, 830 | 3, 032 | 1, 746 | 5, 116 | 5. 5 | 6. 1 | 4. 0 | 9. 5 |
| Figs— | | | | | | | | |
| Total..... | 43, 681 | 39, 504 | 31, 450 | 35, 583 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Turkey (Europe and Asia)..... | 22, 419 | 22, 270 | 16, 566 | 22, 418 | 51. 3 | 56. 4 | 52. 7 | 63. 0 |
| Greece..... | 4, 615 | 6, 842 | 2, 465 | 4, 910 | 10. 6 | 17. 3 | 7. 8 | 13. 8 |
| Portugal..... | 8, 366 | 2, 786 | 5, 933 | 4, 404 | 19. 2 | 7. 1 | 18. 9 | 12. 4 |
| Italy..... | 3, 722 | 3, 305 | 1, 943 | 1, 358 | 8. 5 | 8. 4 | 6. 2 | 3. 8 |
| Other countries..... | 4, 559 | 4, 301 | 4, 552 | 2, 473 | 10. 4 | 10. 8 | 14. 4 | 7. 0 |
| Fresh— | 1,000 bunches | 1,000 bunches | 1,000 bunches | 1,000 bunches | | | | |
| Bananas— | 58, 550 | 57, 102 | 64, 029 | 63, 520 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Total..... | 58, 550 | 57, 102 | 64, 029 | 63, 520 | 100. 0 | 100. 0 | 100. 0 | 100. 0 |
| Central America..... | 34, 840 | 32, 208 | 39, 076 | 42, 386 | 59. 5 | 56. 4 | 62. 0 | 66. 7 |
| Jamaica..... | 14, 766 | 13, 861 | 13, 398 | 11, 712 | 25. 2 | 24. 3 | 20. 9 | 18. 4 |
| Colombia..... | 2, 241 | 2, 073 | 1, 695 | 1, 439 | 4. 2 | 3. 6 | 2. 6 | 2. 3 |
| Cuba..... | 2, 932 | 2, 905 | 2, 730 | 3, 467 | 5. 0 | 5. 1 | 4. 3 | 5. 5 |
| Other countries..... | 3, 581 | 6, 055 | 6, 530 | 4, 516 | 6. 1 | 10. 6 | 10. 2 | 7. 1 |

See footnotes at end of table.

TABLE 499.—Principal agricultural products imported into the United States, by countries, 1926-1929—Continued

| Article and country from which imported | Year ended June 30— | | | | | | | |
|---|---------------------|---------------|---------------|---------------|----------|----------|----------|----------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| VEGETABLE PRODUCTS—continued | | | | | | | | |
| Fruits—Continued. | | | | | | | | |
| Fresh—Continued. | | | | | | | | |
| Lemons— | 1,000 boxes | 1,000 boxes | 1,000 boxes | 1,000 boxes | Per cent | Per cent | Per cent | Per cent |
| Total..... | 1,247 | 659 | 1,308 | 391 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 1,244 | 659 | 1,304 | 390 | 99.8 | 100.0 | 99.7 | 99.7 |
| Italy..... | 1,235 | 654 | 1,300 | 382 | 99.0 | 99.2 | 99.4 | 97.7 |
| Other Europe..... | 9 | 5 | 4 | 8 | .8 | .8 | .3 | 2.0 |
| Other countries..... | 3 | 0 | 4 | 1 | .2 | .0 | .3 | .3 |
| Olives— | 1,000 gallons | 1,000 gallons | 1,000 gallons | 1,000 gallons | | | | |
| Total..... | 5,992 | 5,212 | 6,458 | 6,955 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 5,950 | 5,185 | 6,415 | 6,909 | 99.3 | 99.5 | 99.3 | 99.3 |
| Spain..... | 4,466 | 4,664 | 5,739 | 6,209 | 74.5 | 89.5 | 88.9 | 89.3 |
| Greece..... | 1,127 | 96 | 144 | 204 | 18.8 | 1.8 | 2.2 | 2.9 |
| Other Europe..... | 357 | 425 | 532 | 496 | 6.0 | 8.2 | 8.2 | 7.1 |
| Other countries..... | 42 | 27 | 43 | 46 | .7 | .5 | .7 | .7 |
| Grains, flours, etc.: | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | | | |
| Rice, cleaned, except patna— | 92,629 | 54,088 | 33,674 | 25,166 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total..... | | | | | | | | |
| Hong Kong..... | 21,301 | 19,741 | 20,786 | 17,934 | 23.0 | 36.5 | 61.7 | 71.3 |
| Netherlands..... | 34,692 | 5,837 | 2,139 | 271 | 37.4 | 10.8 | 6.4 | 1.1 |
| Germany..... | 10,038 | 3,768 | 1,077 | 396 | 10.8 | 7.0 | 3.2 | 1.6 |
| Mexico..... | 4,170 | 8,002 | 1,264 | 1,022 | 4.5 | 14.8 | 3.8 | 4.1 |
| British India..... | 2,879 | 465 | 1,061 | 2,380 | 3.1 | .8 | 3.2 | 9.5 |
| Italy..... | 3,664 | 3,695 | 3,971 | 1,032 | 4.0 | 6.8 | 11.8 | 4.1 |
| Siam..... | 112 | 2,912 | 448 | 1 | .1 | 5.4 | 1.3 | .0 |
| United Kingdom..... | 2,332 | 692 | 126 | 12 | 2.5 | 1.3 | .4 | .0 |
| Other countries..... | 13,441 | 8,976 | 2,802 | 2,118 | 14.6 | 16.6 | 8.2 | 8.3 |
| Rice, patna 1— | | | | | | | | |
| Total..... | | 1,221 | 1,826 | 2,349 | | 100.0 | 100.0 | 100.0 |
| Netherlands..... | | 1,215 | 1,826 | 2,349 | | 99.5 | 100.0 | 100.0 |
| Other countries..... | | 6 | 0 | 0 | | .5 | .0 | .0 |
| Rice, uncleaned— | | | | | | | | |
| Total..... | 30,749 | 11,728 | 5,996 | 8,060 | 100.0 | 100.0 | 100.0 | 100.0 |
| Japan..... | 11,686 | 3,213 | 2,316 | 1,441 | 38.0 | 27.4 | 38.6 | 17.9 |
| Mexico..... | 13,708 | 7,802 | 3,036 | 5,004 | 44.6 | 66.5 | 50.6 | 73.3 |
| Other countries..... | 5,355 | 713 | 644 | 715 | 17.4 | 6.1 | 10.8 | 8.8 |
| Rice, flour and meal— | | | | | | | | |
| Total..... | 6,588 | 2,072 | 2,606 | 1,239 | 100.0 | 100.0 | 100.0 | 100.0 |
| Mexico..... | 2,546 | 2,307 | 1,981 | 508 | 38.6 | 77.6 | 76.0 | 41.0 |
| Japan..... | 440 | 469 | 442 | 504 | 6.7 | 15.8 | 17.0 | 40.7 |
| Netherlands..... | 3,189 | 0 | 21 | 0 | 48.4 | .0 | .8 | .0 |
| China..... | 81 | 36 | 38 | 68 | 1.2 | 1.2 | 1.5 | 5.5 |
| Other countries..... | 332 | 160 | 124 | 159 | 5.1 | 5.4 | 4.7 | 12.8 |
| Wheat— | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | | | | |
| Total..... | 15,598 | 13,235 | 15,706 | 21,430 | 100.0 | 100.0 | 100.0 | 100.0 |
| Canada..... | 15,596 | 13,234 | 15,706 | 21,429 | 100.0 | 100.0 | 100.0 | 100.0 |
| Other countries..... | 2 | 1 | 0 | 1 | .0 | .0 | .0 | .0 |
| Wheat flour— | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels | | | | |
| Total..... | 17 | 6 | 6 | 3 | 100.0 | 100.0 | 100.0 | 100.0 |
| Canada..... | 17 | 5 | 3 | 2 | 100.0 | 83.3 | 50.0 | 66.7 |
| Ecuador..... | 0 | 0 | 2 | 0 | .0 | .0 | 33.3 | .0 |
| Other countries..... | 0 | 1 | 1 | 1 | .0 | 16.7 | 16.7 | 33.3 |

See footnotes at end of table.

TABLE 499.—Principal agricultural products imported into the United States, by countries, 1926-1929—Continued

| Article and country from which imported | Year ended June 30— | | | | | | | |
|---|---------------------|--------------|--------------|--------------|----------|----------|----------|----------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| VEGETABLE PRODUCTS—continued | | | | | | | | |
| Nuts: | | | | | | | | |
| Almonds, shelled— | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | Per cent | Per cent | Per cent | Per cent |
| Total | 18,575 | 15,699 | 18,257 | 18,106 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe | 18,280 | 15,171 | 17,843 | 17,536 | 98.4 | 96.6 | 97.7 | 96.9 |
| Italy | 4,156 | 6,076 | 7,703 | 6,578 | 22.4 | 38.7 | 42.2 | 36.3 |
| Spain | 12,901 | 8,389 | 9,637 | 10,399 | 68.9 | 53.4 | 52.8 | 57.4 |
| France | 1,142 | 541 | 306 | 286 | 6.1 | 3.4 | 1.7 | 1.6 |
| Other Europe | 181 | 165 | 197 | 273 | 1.0 | 1.1 | 1.0 | 1.6 |
| Other countries | 295 | 528 | 414 | 570 | 1.6 | 3.4 | 2.3 | 3.1 |
| Almonds, not shelled— | | | | | | | | |
| Total | 3,703 | 638 | 464 | 1,891 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe | 3,670 | 499 | 463 | 1,882 | 99.1 | 78.2 | 99.8 | 99.5 |
| Spain | 3,127 | 158 | 229 | 1,068 | 84.4 | 24.8 | 49.4 | 56.5 |
| France | 335 | 154 | 131 | 474 | 9.0 | 24.1 | 28.2 | 25.1 |
| Italy | 156 | 180 | 98 | 73 | 4.2 | 28.2 | 21.1 | 3.9 |
| Other Europe | 52 | 7 | 5 | 267 | 1.5 | 1.1 | 1.1 | 14.0 |
| Brazil | 0 | 130 | 0 | 0 | .0 | 20.4 | .0 | .0 |
| Other countries | 33 | 9 | 1 | 9 | .9 | 1.4 | .2 | .5 |
| Filberts, shelled— | | | | | | | | |
| Total | 6,669 | 4,950 | 6,600 | 5,606 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe | 6,489 | 4,635 | 4,541 | 3,775 | 97.3 | 93.6 | 68.8 | 67.3 |
| Spain | 669 | 421 | 329 | 639 | 10.0 | 8.5 | 5.0 | 11.4 |
| France | 2,150 | 1,414 | 1,206 | 1,027 | 32.2 | 28.6 | 18.3 | 18.3 |
| Turkey in Europe | 2,325 | 1,910 | 2,559 | 0 | 34.9 | 38.6 | 38.8 | .0 |
| Other Europe | 1,345 | 890 | 447 | 2,109 | 20.2 | 17.9 | 6.7 | 37.6 |
| Turkey in Asia | 124 | 223 | 2,059 | 1,800 | 1.9 | 4.5 | 31.2 | 32.1 |
| Other countries | 56 | 92 | 0 | 31 | .8 | 1.9 | .0 | .6 |
| Filberts, not shelled— | | | | | | | | |
| Total | 11,105 | 9,822 | 11,241 | 12,134 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe | 11,032 | 9,600 | 11,168 | 12,134 | 99.3 | 98.7 | 99.3 | 100.0 |
| Italy | 8,546 | 9,296 | 6,687 | 11,053 | 77.0 | 94.6 | 59.5 | 91.1 |
| Spain | 714 | 49 | 1,936 | 818 | 6.4 | .5 | 17.2 | 6.7 |
| Turkey (Europe and Asia) | 976 | 54 | 1,265 | 20 | 8.8 | .5 | 11.3 | .2 |
| Other Europe | 796 | 291 | 1,280 | 243 | 7.1 | 3.1 | 11.3 | 2.0 |
| Other countries | 73 | 132 | 76 | 0 | .7 | 1.3 | .7 | .0 |
| Peanuts, shelled— | | | | | | | | |
| Total | 33,666 | 46,852 | 54,784 | 26,606 | 100.0 | 100.0 | 100.0 | 100.0 |
| China | 32,351 | 44,729 | 49,986 | 23,987 | 96.1 | 95.5 | 91.2 | 90.2 |
| Other countries | 1,315 | 2,123 | 4,798 | 2,619 | 3.9 | 4.5 | 8.8 | 9.8 |
| Peanuts, not shelled— | | | | | | | | |
| Total | 3,539 | 4,410 | 13,498 | 5,709 | 100.0 | 100.0 | 100.0 | 100.0 |
| China | 2,837 | 3,812 | 12,339 | 4,680 | 80.2 | 86.4 | 91.4 | 82.0 |
| Japan, including Chosen | 235 | 245 | 509 | 360 | 6.6 | 5.6 | 3.8 | 6.3 |
| Other countries | 467 | 353 | 650 | 669 | 13.2 | 8.0 | 4.8 | 11.7 |
| Walnuts, shelled— | | | | | | | | |
| Total | 22,680 | 20,979 | 16,015 | 17,956 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe | 19,296 | 12,002 | 13,540 | 11,341 | 85.1 | 57.2 | 84.5 | 63.2 |
| France | 17,474 | 8,995 | 12,551 | 9,308 | 77.0 | 42.9 | 78.4 | 51.8 |
| Other Europe | 1,822 | 3,007 | 989 | 2,033 | 8.1 | 14.3 | 6.1 | 11.4 |
| China | 3,020 | 8,144 | 1,952 | 5,052 | 13.3 | 38.8 | 12.2 | 28.1 |
| Other countries | 364 | 833 | 523 | 1,563 | 1.6 | 4.0 | 3.3 | 8.7 |

TABLE 499.—*Principal agricultural products imported into the United States, by countries, 1926-1929—Continued*

| Article and country from which imported | Year ended June 30— | | | | | | | |
|---|---------------------|---------------|---------------|---------------|----------|----------|----------|----------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| VEGETABLES PRODUCTS—continued | | | | | | | | |
| Nuts—Continued. | | | | | | | | |
| Walnuts, not shelled— | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | Per cent | Per cent | Per cent | Per cent |
| Total..... | 21,472 | 25,706 | 10,314 | 15,581 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total Europe..... | 18,408 | 18,652 | 6,946 | 10,557 | 85.7 | 72.6 | 67.3 | 67.8 |
| Italy..... | 9,064 | 12,082 | 4,558 | 4,501 | 42.2 | 47.0 | 44.2 | 28.9 |
| France..... | 6,798 | 3,506 | 2,244 | 2,720 | 31.7 | 13.9 | 21.8 | 17.5 |
| Other Europe..... | 2,546 | 3,004 | 144 | 3,336 | 11.8 | 11.7 | 1.3 | 21.4 |
| China..... | 2,395 | 5,870 | 2,531 | 4,575 | 11.2 | 22.8 | 24.5 | 29.4 |
| Other countries..... | 669 | 1,184 | 837 | 449 | 3.1 | 4.6 | 8.2 | 2.8 |
| Oils, vegetable: | | | | | | | | |
| Coconut oil, product of Philippine Islands..... | 200,878 | 286,776 | 273,309 | 377,288 | 100.0 | 100.0 | 100.0 | 100.0 |
| Olive oil, edible— | | | | | | | | |
| Total..... | 83,178 | 87,922 | 70,130 | 88,118 | 100.0 | 100.0 | 100.0 | 100.9 |
| Total Europe..... | 81,666 | 86,393 | 69,231 | 86,821 | 98.2 | 98.3 | 98.7 | 98.5 |
| Italy..... | 57,821 | 58,706 | 45,145 | 62,202 | 69.5 | 66.8 | 64.4 | 70.6 |
| Spain..... | 17,147 | 21,682 | 17,797 | 16,910 | 20.6 | 24.7 | 25.4 | 19.2 |
| France..... | 5,647 | 4,705 | 5,335 | 6,182 | 6.8 | 5.4 | 7.6 | 7.0 |
| Other Europe..... | 1,051 | 1,300 | 954 | 1,527 | 1.3 | 1.4 | 1.3 | 1.7 |
| Other countries..... | 1,512 | 1,529 | 899 | 1,297 | 1.8 | 1.7 | 1.3 | 1.5 |
| Soy-bean oil— | | | | | | | | |
| Total..... | 17,401 | 23,533 | 14,562 | 17,172 | 100.0 | 100.0 | 100.0 | 100.0 |
| Kwantung..... | 13,801 | 15,759 | 13,546 | 11,089 | 79.3 | 66.9 | 93.0 | 64.6 |
| China..... | 1 | 1,803 | 891 | 1,520 | .0 | 7.7 | 6.1 | 8.9 |
| Japan..... | 2,801 | 4,033 | 41 | 1,729 | 16.1 | 17.1 | .3 | 10.1 |
| Other countries..... | 798 | 1,958 | 84 | 2,834 | 4.6 | 8.3 | .6 | 16.4 |
| Oilseeds: | | | | | | | | |
| Copra, not prepared— | | | | | | | | |
| Total..... | 392,759 | 454,546 | 456,158 | 629,937 | 100.0 | 100.0 | 100.0 | 100.0 |
| Philippine Islands..... | 248,587 | 330,946 | 336,920 | 386,567 | 63.3 | 72.8 | 73.9 | 61.4 |
| French Oceania..... | 24,799 | 29,188 | 25,273 | 21,306 | 6.3 | 6.4 | 5.5 | 3.4 |
| British Malaya..... | 70,386 | 59,746 | 40,381 | 84,700 | 17.9 | 13.1 | 8.9 | 13.4 |
| British Oceania..... | 27,600 | 19,131 | 19,941 | 37,685 | 7.0 | 4.2 | 4.4 | 6.0 |
| Other countries..... | 21,387 | 15,535 | 33,643 | 99,679 | 5.5 | 3.5 | 7.3 | 15.8 |
| Flaxseed— | 1,000 bushels | 1,000 bushels | 1,000 bushels | 1,000 bushels | | | | |
| Total..... | 19,374 | 24,224 | 18,112 | 23,437 | 100.0 | 100.0 | 100.0 | 100.0 |
| Argentina..... | 16,375 | 20,581 | 16,057 | 20,581 | 84.6 | 85.0 | 88.7 | 87.8 |
| Canada..... | 2,949 | 3,429 | 1,933 | 2,528 | 15.2 | 14.2 | 10.7 | 10.8 |
| Other countries..... | 30 | 214 | 122 | 328 | .2 | .8 | .6 | 1.4 |
| Seeds, except oilseeds: | | | | | | | | |
| Clover seed— | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | | | | |
| Clover, red— | 19,589 | 11,012 | 5,434 | 7,552 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total..... | 18,899 | 10,702 | 5,388 | 7,401 | 96.5 | 97.2 | 99.2 | 98.0 |
| Total Europe..... | 18,336 | 10,173 | 493 | 3,664 | 93.6 | 92.4 | 91.1 | 48.5 |
| France..... | 377 | 251 | 697 | 679 | 1.9 | 2.3 | 12.8 | 9.0 |
| Germany..... | 5 | 0 | 2,015 | 1,278 | .0 | .0 | 37.1 | 16.9 |
| Poland-Danzig..... | 0 | 0 | 1,328 | 202 | .0 | .0 | 24.4 | 2.7 |
| Russia in Europe..... | 181 | 278 | 855 | 1,578 | 1.0 | 2.5 | 15.8 | 20.9 |
| Other Europe..... | 690 | 310 | 40 | 151 | 3.5 | 2.8 | .8 | 2.0 |
| Other countries..... | | | | | | | | |

TABLE 499.—Principal agricultural products imported into the United States, by countries, 1926-1929—Continued

| Article and country from which imported | Year ended June 30— | | | | | | | |
|---|-------------------------|-------------------------|-------------------------|-------------------------|-----------------|-----------------|-----------------|-----------------|
| | 1926 | 1927 | 1928 | 1929 | 1926 | 1927 | 1928 | 1929 |
| VEGETABLES PRODUCTS—continued | | | | | | | | |
| Seeds, except oilseeds—Continued. | | | | | | | | |
| All other, including alsike, crimson, and all other clover— | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>Per cent</i> | <i>Per cent</i> | <i>Per cent</i> | <i>Per cent</i> |
| Total..... | 29,093 | 14,333 | 16,397 | 14,944 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total, Europe..... | 8,405 | 3,581 | 3,260 | 4,975 | 28.9 | 25.0 | 19.9 | 33.3 |
| France..... | 5,826 | 1,561 | 791 | 2,750 | 20.0 | 10.9 | 4.8 | 18.4 |
| Germany..... | 965 | 455 | 799 | 1,651 | 3.3 | 3.2 | 4.9 | 11.0 |
| Other Europe..... | 1,614 | 1,565 | 1,670 | 574 | 5.6 | 10.0 | 10.2 | 3.9 |
| Canada..... | 20,679 | 10,745 | 13,121 | 8,899 | 71.1 | 75.0 | 80.0 | 59.5 |
| Other countries..... | 9 | 7 | 16 | 1,070 | .0 | .0 | .1 | 7.2 |
| Spices: | | | | | | | | |
| Pepper, unground— | | | | | | | | |
| Total..... | 28,221 | 25,217 | 23,978 | 25,663 | 100.0 | 100.0 | 100.0 | 100.0 |
| Dutch East Indies..... | 12,745 | 6,636 | 6,446 | 9,205 | 45.2 | 26.3 | 26.9 | 35.9 |
| British Malaya..... | 2,419 | 2,287 | 2,831 | 1,469 | 8.6 | 9.1 | 11.8 | 5.7 |
| British India..... | 9,533 | 11,048 | 7,907 | 6,218 | 33.8 | 43.8 | 32.9 | 24.2 |
| United Kingdom..... | 1,063 | 3,577 | 5,292 | 3,435 | 3.8 | 14.2 | 22.1 | 13.4 |
| Other countries..... | 2,461 | 1,669 | 1,502 | 5,330 | 8.6 | 6.6 | 6.3 | 20.8 |
| Sugar, raw, cane: | <i>1,000 short tons</i> | <i>1,000 short tons</i> | <i>1,000 short tons</i> | <i>1,000 short tons</i> | | | | |
| Total..... | 4,420 | 4,420 | 4,045 | 4,752 | 100.0 | 100.0 | 100.0 | 100.0 |
| Cuba..... | 3,861 | 3,953 | 3,399 | 4,109 | 87.4 | 89.4 | 84.0 | 86.5 |
| Philippine Islands..... | 510 | 428 | 613 | 605 | 11.5 | 9.7 | 15.2 | 12.7 |
| Other countries..... | 49 | 39 | 33 | 38 | 1.1 | .9 | .8 | .8 |
| Tea. | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | | | | |
| Total..... | 99,411 | 97,402 | 90,099 | 92,635 | 100.0 | 100.0 | 100.0 | 100.0 |
| Japan..... | 29,135 | 28,430 | 25,399 | 27,329 | 29.3 | 29.2 | 28.2 | 29.5 |
| United Kingdom..... | 22,928 | 22,136 | 20,380 | 23,608 | 23.1 | 22.7 | 22.6 | 25.5 |
| Ceylon..... | 17,717 | 16,578 | 16,326 | 16,893 | 17.8 | 17.0 | 18.1 | 18.2 |
| China..... | 13,713 | 11,655 | 10,131 | 8,878 | 13.8 | 12.0 | 11.1 | 9.6 |
| Dutch East Indies..... | 8,264 | 7,660 | 5,308 | 5,358 | 8.3 | 7.9 | 6.0 | 5.8 |
| British India..... | 5,051 | 8,059 | 9,108 | 7,688 | 5.1 | 8.3 | 10.2 | 8.3 |
| Other countries..... | 2,603 | 2,884 | 3,267 | 2,881 | 2.6 | 2.9 | 3.8 | 3.1 |
| Tobacco, leaf, unmanufactured: | | | | | | | | |
| Leaf, product of Philippine Islands..... | 1,129 | 1,117 | 2,541 | 4,678 | 100.0 | 100.0 | 100.0 | 100.0 |
| Leaf, for cigar wrappers— | | | | | | | | |
| Total..... | 6,500 | 6,473 | 6,344 | 6,212 | 100.0 | 100.0 | 100.0 | 100.0 |
| Netherlands..... | 6,354 | 6,358 | 6,218 | 6,095 | 96.4 | 98.2 | 98.0 | 98.1 |
| Other countries..... | 236 | 115 | 126 | 117 | 3.6 | 1.8 | 2.0 | 1.9 |
| All other leaf— | | | | | | | | |
| Total..... | 60,561 | 83,499 | 70,227 | 66,001 | 100.0 | 100.0 | 100.0 | 100.0 |
| Greece..... | 13,342 | 28,383 | 15,694 | 16,741 | 22.0 | 34.0 | 22.3 | 25.4 |
| Cuba..... | 20,976 | 24,233 | 21,530 | 22,116 | 34.6 | 29.0 | 30.7 | 33.5 |
| Italy..... | 12,412 | 13,708 | 13,743 | 11,286 | 20.5 | 16.4 | 19.6 | 17.1 |
| Turkey (Europe and Asia)..... | 12,571 | 13,855 | 17,289 | 14,269 | 20.8 | 18.4 | 24.6 | 21.6 |
| Germany..... | 141 | 973 | 1,242 | 305 | .2 | 1.2 | 1.8 | .5 |
| Other countries..... | 1,110 | 847 | 729 | 1,284 | 1.9 | 1.0 | 1.0 | 1.9 |
| India rubber, crude: | | | | | | | | |
| Total..... | 921,064 | 962,467 | 928,040 | 1,226,929 | 100.0 | 100.0 | 100.0 | 100.0 |
| British Malaya..... | 556,907 | 602,756 | 524,834 | 811,843 | 60.4 | 62.6 | 56.7 | 66.2 |
| Dutch East Indies..... | 157,150 | 156,772 | 170,161 | 215,863 | 17.0 | 16.3 | 18.4 | 17.6 |
| United Kingdom..... | 60,706 | 58,155 | 110,575 | 50,938 | 6.6 | 5.7 | 11.9 | 4.2 |
| Ceylon..... | 73,846 | 89,874 | 73,542 | 112,257 | 8.0 | 9.3 | 7.9 | 9.1 |
| Other countries..... | 73,355 | 57,910 | 46,928 | 36,028 | 8.0 | 6.1 | 5.1 | 2.9 |

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1927-1929, and official records of the Bureau of Foreign and Domestic Commerce.

¹ January-June.

² Boxes of 74 pounds net.

³ Not separately classified prior to Jan. 1, 1927.

TABLE 500.—Vegetable oils: Exports from the United States, 1910-1929

| Year ended June 30— | Corn | Cotton-seed | Linseed | Cocoa butter or but-terine | Coconut | Peanut | Soybean |
|------------------------|--------------|--------------|--------------|----------------------------|--------------|------------------|--------------|
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| 1910..... | 11,299 | 223,955 | 228 | | | | |
| 1911..... | 25,317 | 225,521 | 175 | | | | |
| 1912..... | 23,866 | 399,471 | 247 | | | | |
| 1913..... | 19,839 | 315,233 | 1,734 | | | | |
| 1914..... | 18,282 | 192,903 | 239 | | | | |
| 1915..... | 17,790 | 318,307 | 1,212 | | | | |
| 1916..... | 8,968 | 260,512 | 714 | | | | |
| 1917..... | 8,780 | 158,912 | 1,202 | | | | |
| 1918..... | 1,831 | 100,780 | 1,188 | | | | |
| 1919..... | 1,095 | 178,709 | 1,096 | | | | |
| 1920..... | 12,483 | 159,400 | 1,136 | 11,048 | 141,088 | 4,922 | 67,782 |
| 1921..... | 6,919 | 283,268 | 561 | 3,171 | 6,639 | 1,505 | 5,118 |
| 1922..... | 5,280 | 91,615 | 366 | 1,856 | 10,185 | 1,802 | 5,537 |
| 1923..... | 5,224 | 64,292 | 414 | 957 | 12,993 | 188 | 2,495 |
| 1924..... | 4,196 | 39,418 | 350 | 888 | 19,423 | 168 | 2,892 |
| 1925..... | 3,586 | 53,261 | 320 | 1,577 | 17,890 | (¹) | 579 |
| 1926..... | 2,927 | 59,015 | 311 | 1,766 | 15,444 | (¹) | 623 |
| 1927..... | 405 | 57,580 | 365 | 290 | 19,826 | (¹) | 3,104 |
| 1928..... | 329 | 61,470 | 206 | 1,897 | 22,358 | (¹) | 7,514 |
| 1929, preliminary..... | 323 | 29,531 | 269 | 1,010 | 24,556 | (¹) | 8,241 |

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1910-1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1929.

¹ Included with "Other vegetable oils and fats."

TABLE 501.—Vegetable oils: Imports into the United States, 1910-1929

| Year ended June 30— | Cas-tor ¹ | Chi-nese nut | Cocoa butter or but-terine | Coco-nut | Cot-ton-seed ¹ | Lin-seed | Olive | Palm | Palm kernel | Pea-nut | Rape-seed | Soy-bean |
|------------------------|----------------------|--------------|----------------------------|------------|---------------------------|------------------|-------------|------------|------------------|------------------|--------------------|------------------|
| | 1,000 gals. | 1,000 gals. | 1,000 lbs. | 1,000 lbs. | 1,000 lbs. | 1,000 gals. | 1,000 gals. | 1,000 lbs. | 1,000 lbs. | 1,000 gals. | 1,000 gals. | 1,000 lbs. |
| 1910..... | 7 | 5,760 | 3,370 | 48,346 | (²) | (²) | 4,545 | 92,772 | (³) | (⁴) | ¹ 1,083 | (⁵) |
| 1911..... | 7 | 7,042 | 4,279 | 51,118 | (²) | (²) | 4,984 | 57,100 | (³) | (⁴) | ¹ 1,363 | (⁵) |
| 1912..... | 8 | 4,768 | 6,075 | 46,371 | 1,513 | 737 | 5,473 | 47,159 | 25,393 | 896 | 1,183 | 28,021 |
| 1913..... | 5 | 5,997 | 3,603 | 50,504 | 3,384 | 174 | 5,840 | 50,229 | 23,569 | 1,196 | 1,550 | 12,340 |
| 1914..... | 189 | 4,932 | 2,839 | 74,386 | 17,293 | 192 | 6,981 | 58,040 | 34,328 | 1,337 | 1,404 | 16,360 |
| 1915..... | 63 | 4,940 | 150 | 63,135 | 15,162 | 535 | 7,364 | 31,486 | 4,906 | 853 | 1,499 | 19,207 |
| 1916..... | 253 | 4,968 | 400 | 66,008 | 17,181 | 50 | 8,109 | 40,497 | 6,761 | 1,475 | 2,561 | 98,120 |
| 1917..... | 324 | 6,864 | 166 | 79,223 | 13,703 | 111 | 8,184 | 36,074 | 1,857 | 3,026 | 1,085 | 162,090 |
| 1918..... | 1,175 | 4,816 | (²) | 259,195 | 14,291 | 51 | 2,652 | 27,405 | 19 | 8,289 | 3,056 | 336,825 |
| 1919..... | 472 | 6,217 | | 334,728 | 20,410 | 990 | 4,398 | 19,281 | 1,945 | 11,393 | 2,091 | 236,805 |
| 1920..... | 271 | 10,614 | | 422,711 | 540 | 21,165 | 4,550 | 50,165 | 54 | 22,064 | 1,230 | 195,774 |
| 1921..... | 99 | 4,440 | | 915,173 | 889 | 1,315 | 1,997 | 31,076 | 2,769 | 2,422 | 1,172 | 49,331 |
| 1922..... | 46 | 7,410 | | 7,129 | 230,236 | (²) | 22,494 | 11,112 | 39,159 | | 384 | 8,283 |
| 1923..... | 185 | 11,919 | | 3,010 | 212,573 | 45 | 7,568 | 15,635 | 118,816 | | 1,007 | 17,631 |
| 1924..... | 36 | 10,780 | | 1,169 | 181,230 | (²) | 2,379 | 15,121 | 86,784 | 1,126 | 2,008 | 2,068 |
| 1925..... | 41 | 12,626 | | 733 | 250,121 | 0 | 3,145 | 15,743 | 114,387 | 37,364 | 468 | 1,959 |
| 1926..... | 66 | 11,315 | | 14,200 | 878 | 283 | 2,231 | 18,368 | 152,254 | 85,074 | 450 | 2,088 |
| 1927..... | 22 | 13,657 | | 256 | 286,776 | 6,396 | 177 | 17,964 | 110,184 | 14,760 | 1,061 | 2,731 |
| 1928..... | 125 | 11,150 | | 18 | 273,309 | 1 | 46 | 15,746 | 183,977 | 56,021 | 648 | 2,604 |
| 1929, preliminary..... | 138 | 15,365 | | 17 | 377,288 | 1 | 890 | 19,706 | 228,330 | 80,514 | 454 | 2,548 |

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States 1910-1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919-1929.

¹ Imports for consumption.

² Includes peanut oil.

³ Included in all other fixed or expressed.

⁴ Included in Chinese nut oil.

⁵ Includes hempseed.

⁶ Less than 500 pounds.

TABLE 502.—*Oil cake and oil-cake meal: International trade, average 1909-1913, annual 1926-1928*

| Country | Year ended Dec. 31 | | | | | | | |
|-------------------------------|--------------------|--------------|--------------|--------------|--------------|--------------|-------------------|--------------|
| | Average 1909-1913 | | 1926 | | 1927 | | 1928, preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| United States..... | 0 | 1,704,124 | 120,555 | 1,449,758 | 188,884 | 1,569,969 | 250,786 | 1,186,934 |
| Russia..... | 0 | 1,453,413 | 0 | 894,464 | 0 | 663,840 | 0 | 314,627 |
| Germany..... | 1,686,416 | 525,108 | 971,767 | 835,906 | 1,231,000 | 697,136 | 1,205,083 | 972,716 |
| British India..... | 1,262 | 268,648 | 305 | 499,052 | 220 | 581,860 | 320 | 600,241 |
| France..... | 288,968 | 476,863 | 55,132 | 304,737 | 90,852 | 325,283 | 75,411 | 438,107 |
| Egypt..... | 0 | 161,624 | 11 | 355,684 | 2 | 401,257 | ----- | 347,802 |
| Egypt..... | 1 174 | 147,468 | 0 | 284,486 | 0 | 230,257 | 0 | 287,111 |
| Italy..... | 10,550 | 55,115 | 631 | 140,812 | 632 | 265,450 | 230 | 324,048 |
| Argentina..... | 0 | 42,587 | 0 | 134,037 | 0 | 173,438 | 0 | 144,049 |
| Dutch East Indies..... | 2,509 | 13,242 | 0 | 105,788 | 0 | 140,736 | 0 | 166,488 |
| Rumania..... | 12 | 21,654 | 14 | 131,812 | ----- | ----- | ----- | ----- |
| Peru..... | 0 | 10,930 | 0 | 66,656 | 0 | 88,428 | 0 | 79,042 |
| Brazil..... | 0 | 6,574 | 0 | 61,720 | ----- | ----- | ----- | ----- |
| Czechoslovakia..... | 0 | 0 | 57,251 | 61,046 | 72,817 | 54,878 | 106,306 | 46,186 |
| Canada..... | 7,752 | 51,370 | 19,192 | 39,323 | 15,486 | 46,147 | 13,930 | 44,419 |
| Spain..... | 0 | 2,164 | 1,493 | 44,445 | ----- | ----- | ----- | ----- |
| Australia..... | 148 | 1,347 | 4 15 | 4 902 | 4 4,772 | 4 928 | 4 6,261 | 4 5,711 |
| Hungary..... | 53,673 | 124,873 | 8,591 | 14,233 | 15,911 | 15,966 | 29,536 | 12,045 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | |
| Denmark..... | 1,002,329 | 15,777 | 1,532,525 | 33,434 | 1,587,719 | 22,891 | 1,471,914 | ----- |
| United Kingdom..... | 790,865 | 161,798 | 1,105,848 | 193,285 | 1,087,257 | 144,243 | 819,004 | 208,134 |
| Netherlands..... | 707,116 | 219,819 | 731,235 | 117,686 | 692,427 | 130,177 | 669,165 | 120,620 |
| Japan..... | 189,868 | 0 | 392,675 | 29,894 | 314,853 | 29,436 | 350,960 | 56,245 |
| Belgium..... | 543,648 | 155,373 | 280,298 | 79,031 | 346,224 | 81,009 | 334,994 | 93,864 |
| Sweden..... | 346,755 | 1,535 | 396,235 | 7,430 | 293,246 | 15,963 | 311,856 | 9,416 |
| Irish Free State..... | 0 | 0 | 104,666 | 0 | 111,835 | 0 | 106,412 | 0 |
| Finland..... | 25,333 | 2,125 | 216,906 | 0 | 163,078 | 0 | 262,969 | 0 |
| Switzerland..... | 69,352 | 1,413 | 83,944 | 13,653 | 56,064 | 18,536 | 75,052 | 17,735 |
| Norway..... | 55,112 | 2,889 | 71,900 | 62 | 77,298 | 8 | 63,371 | ----- |
| Ceylon..... | 40,494 | 28,509 | 42,851 | 17,953 | 43,045 | 19,393 | 42,636 | 32,650 |
| Austria..... | ----- | ----- | 20,293 | 1,812 | 33,204 | 745 | 45,513 | 899 |
| Total 30 countries..... | 5,822,336 | 5,656,342 | 6,214,333 | 5,919,061 | 6,326,816 | 5,718,012 | 6,241,711 | 5,608,392 |

Bureau of Agricultural Economics. Official sources except as otherwise noted. The class called here "Oil cake and oil-cake meal" includes the edible cake and meal remaining after making oil from such products as cottonseed, flaxseed, peanuts, corn, etc. Soybean cake is not included in this table.

¹2-year average.

²Java and Madura only.

³4-year average.

⁴Year ended June 30.

⁵Average for Austria-Hungary.

⁶1 year only.

TABLE 503.—*Rubber: International trade, average 1909-1913, annual 1926-1928*

| Country | Year ended Dec. 31 | | | | | | | |
|-----------------------------------|--------------------|--------------|--------------|--------------|--------------|--------------|-------------------|--------------|
| | Average 1909-1913 | | 1926 | | 1927 | | 1928, preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| British Malaya..... | 1 53,472 | 1 85,435 | 340,890 | 883,121 | 411,473 | 837,136 | 336,009 | 920,326 |
| Dutch East Indies..... | 1 1 | 7,679 | 0 | 538,986 | 0 | 629,004 | 0 | 132,142 |
| Ceylon..... | 1 299 | 10,953 | 10,944 | 131,876 | 11,119 | 125,063 | 11,435 | 128,326 |
| Brazil..... | 0 | 84,938 | 0 | 48,954 | 0 | 57,677 | 0 | 41,200 |
| British India..... | 0 | 1 504 | 18 | 22,118 | 72 | 25,520 | 33 | 24,180 |
| Indo-China..... | 1 | 398 | 1 25 | 19,350 | 1 31 | 21,225 | | 21,599 |
| British North Borneo..... | 0 | 1 331 | 0 | 1 13,656 | 0 | 14,788 | | |
| Bolivia..... | 0 | 8,395 | 0 | 6,844 | 0 | 8,517 | | |
| Mexico..... | 0 | 1 13,462 | 1 259 | 1 11,080 | 1 313 | 10,946 | | |
| French Guinea..... | 1 241 | 3,937 | 1 81 | 2,744 | 1 4 | 1 2,060 | | |
| French Equatorial Africa..... | 1 10 | 1 3,775 | 1 389 | 1 3,483 | 1 454 | 1 3,332 | | |
| Kamerun..... | 0 | 6,409 | 0 | 12,286 | 1 7 | 1 1,970 | | |
| Ecuador..... | 0 | 1,040 | 0 | 2,400 | 0 | 2,290 | | |
| Belgian Congo..... | 0 | 7,755 | 3 | 2,489 | 0 | 2,750 | | |
| Nigeria..... | 0 | 3,054 | 0 | 13,571 | 0 | 14,474 | | |
| Switzerland..... | 391 | 725 | 914 | 1,750 | 1,093 | 1,694 | 1,268 | 2,281 |
| Gold Coast..... | 0 | 2,393 | 0 | 1 1,418 | 0 | 1 711 | | |
| Peru..... | 0 | 5,030 | 0 | 466 | 0 | 697 | | |
| Angola..... | 0 | 5,620 | 0 | 1 1,836 | 0 | 1 962 | | |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | |
| United States..... | 100,180 | 0 | 925,878 | 0 | 954,750 | 0 | 978,107 | 0 |
| France..... | 32,704 | 21,615 | 107,361 | 20,222 | 95,128 | 18,714 | 114,389 | 21,487 |
| Germany..... | 42,004 | 9,844 | 55,201 | 4,185 | 93,836 | 6,721 | 93,455 | 8,660 |
| Japan..... | 1,917 | 0 | 40,923 | 0 | 46,997 | 0 | 57,440 | 0 |
| Canada..... | 3,945 | 0 | 45,367 | 0 | 59,253 | 0 | 69,220 | 0 |
| Italy..... | 5,381 | 225 | 23,983 | 596 | 25,206 | 204 | 27,883 | 58 |
| United Kingdom..... | 43,141 | 0 | 190,251 | 0 | 134,047 | 0 | 10,855 | 0 |
| Netherlands..... | 10,822 | 7,172 | 11,925 | 5,943 | 10,813 | 9,389 | 9,433 | 4,527 |
| Russia..... | 19,131 | 0 | 10,391 | 0 | 22,868 | 0 | 33,975 | 0 |
| Belgium..... | 25,891 | 20,749 | 8,074 | 2,665 | 17,095 | 2,069 | 21,498 | 2,874 |
| Spain..... | 1,067 | 0 | 8,804 | 0 | | | | |
| Austria..... | 1 6,696 | 1 1,619 | 5,008 | 1,019 | 7,750 | 1,231 | 8,001 | 1,163 |
| Sweden..... | 1,695 | 1 | 4,701 | 167 | 4,951 | 168 | 5,218 | 170 |
| Czechoslovakia ¹ | 0 | 0 | 1,122 | 32 | 6,568 | 489 | | |
| Hungary..... | 0 | 0 | 1,327 | 66 | 2,424 | 78 | 3,349 | 269 |
| Denmark..... | 250 | 0 | 1,291 | 4 | 1,289 | 7 | 1,269 | |
| Total 35 countries..... | 350,239 | 314,058 | 1,801,134 | 1,733,359 | 1,907,541 | 1,789,866 | 1,782,837 | 1,309,251 |

Bureau of Agricultural Economics. Official sources except where otherwise noted. Figures for rubber include "India rubber" so called, caoutchouc, caucho, jebe (Peru), hule (Mexico), borracha, mass-randubia mangabeira, manicoba, sorva, and seringa (Brazil), gamelastiek (Dutch East Indies), caura, ser nambh (Venezuela).

¹ International Yearbook of Agricultural Statistics.

² 1 year only.

³ Java and Madura.

⁴ 3-year average.

⁵ Average for Austria-Hungary.

TABLE 504.—Coffee: International trade, average 1909–1913, annual 1926–1928

| Country | Year ended Dec. 31 | | | | | | | |
|-------------------------------|--------------------|--------------|--------------|--------------|--------------|--------------|-------------------|--------------|
| | Average 1909–1913 | | 1926 | | 1927 | | 1928, preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| Brazil..... | 0 | 1,672,282 | 0 | 1,818,899 | 0 | 1,999,352 | 0 | 1,836,123 |
| Colombia..... | 0 | 104,398 | 0 | 1324,689 | 0 | 186,957 | 0 | 107,672 |
| Dutch East Indies..... | 4,227 | 54,149 | 2,439 | 164,070 | 3,726 | 112,569 | 193 | 98,245 |
| Venezuela..... | 0 | 111,326 | 0 | 133,946 | 0 | 116,539 | 0 | 84,579 |
| Guatemala..... | 0 | 85,951 | 0 | 94,410 | 0 | 79,813 | 0 | 69,042 |
| Salvador..... | 1,563 | 62,830 | 0 | 111,611 | 0 | 68,280 | 0 | 39,252 |
| Haiti..... | 0 | 61,943 | 0 | 73,666 | 0 | 35,613 | 0 | 28,556 |
| Mexico..... | 167 | 48,991 | 153 | 146,836 | 220 | 57,499 | 0 | 0 |
| Costa Rica..... | 0 | 27,515 | 0 | 40,248 | 10 | 22,608 | 0 | 0 |
| Nicaragua..... | 138 | 19,033 | 99 | 38,959 | 0 | 31,329 | 4,943 | 0 |
| British India..... | 605 | 27,780 | 4,746 | 12,247 | 4,664 | 19,153 | 0 | 0 |
| Jamaica..... | 0 | 8,263 | 0 | 17,439 | 10 | 0 | 0 | 0 |
| PRINCIPAL IMPORTING COUNTRIES | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| United States..... | 907,899 | 144,251 | 1,493,316 | 29,433 | 1,433,340 | 18,459 | 1,456,527 | 8,520 |
| France..... | 245,752 | 41 | 340,023 | 293 | 350,526 | 161 | 363,909 | 131 |
| Germany..... | 399,965 | 1,757 | 232,364 | 267 | 274,337 | 241 | 299,209 | 417 |
| Netherlands..... | 283,633 | 189,288 | 114,262 | 44,984 | 111,358 | 36,861 | 110,679 | 32,783 |
| Italy..... | 58,278 | 458 | 96,417 | 3 | 100,851 | 3 | 105,196 | 3 |
| Sweden..... | 74,486 | 24 | 92,519 | 31 | 95,034 | 23 | 94,777 | 49 |
| Belgium..... | 111,738 | 33,627 | 88,011 | 412 | 91,474 | 838 | 87,106 | 1,116 |
| Spain..... | 29,317 | 9 | 44,680 | 3 | 52,899 | 12 | 0 | 0 |
| Argentina..... | 28,125 | 0 | 51,312 | 0 | 54,069 | 0 | 0 | 0 |
| Denmark..... | 33,102 | 152 | 55,996 | 535 | 54,445 | 631 | 56,491 | 765 |
| United Kingdom..... | 28,581 | 241 | 25,189 | 221 | 45,490 | 212 | 45,933 | 0 |
| Finland..... | 28,624 | 0 | 29,167 | 0 | 33,678 | 0 | 40,640 | 0 |
| Norway..... | 29,309 | 0 | 37,293 | 0 | 37,818 | 0 | 36,726 | 0 |
| Cuba..... | 24,906 | 4 | 15,671 | 2 | 22,780 | 1 | 0 | 0 |
| Union of South Africa..... | 26,458 | 36 | 27,829 | 13 | 29,532 | 10 | 20,631 | 16 |
| Switzerland..... | 25,029 | 62 | 29,144 | 150 | 29,250 | 201 | 27,668 | 270 |
| Czechoslovakia..... | 0 | 0 | 29,200 | 1 | 29,591 | 5 | 28,497 | 3 |
| Canada..... | 13,378 | 55 | 24,747 | 41 | 26,513 | 58 | 28,143 | 47 |
| Egypt..... | 15,654 | 0 | 20,815 | 10 | 21,925 | 4 | 18,835 | 5 |
| Yugoslavia ¹ | 0 | 0 | 20,507 | 3 | 20,679 | 1 | 21,192 | 1 |
| British Malaya..... | 17,524 | 17,137 | 18,581 | 10,234 | 18,870 | 10,364 | 14,648 | 7,003 |
| Austria..... | 128,304 | 8 | 18,873 | 4 | 18,190 | 5 | 19,156 | 7 |
| Poland..... | 0 | 0 | 13,990 | 1 | 15,398 | 2 | 16,211 | 13 |
| Hungary..... | 0 | 0 | 6,934 | 0 | 8,043 | 0 | 8,424 | 0 |
| Russia..... | 26,073 | 0 | 1650 | 10 | 11,911 | 10 | 0 | 0 |
| Total 37 countries..... | 2,532,865 | 2,561,611 | 2,934,927 | 2,953,729 | 2,986,611 | 2,787,804 | 2,911,640 | 2,314,618 |

Bureau of Agricultural Economics. Compiled from official sources except where otherwise noted. The item coffee comprises unhulled and hulled, ground or otherwise prepared, but imitation or "surrogate" coffee and chicory are excluded.

¹ International Yearbook of Agricultural Statistics.

² Java and Madura only.

³ 1 year only.

⁴ 4-year average.

⁵ Fiscal year, presumably a crop year ended September 30.

⁶ 3-year average.

⁷ Chiefly from Porto Rico.

⁸ Average for Austria-Hungary.

FOREIGN TRADE IN AGRICULTURAL PRODUCTS

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TABLE 505.—Tea: International trade, average 1909-1913, annual 1925-1928

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|----------------------|--------------------|--------------|--------------------|--------------|--------------------|--------------|------------------|--------------------|----------------------|
| | Average 1909-1913 | | 1925 | | 1926 | | 1927 | | 1928, Preliminary | |
| | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports | Im-ports | Ex-ports |
| PRINCIPAL EXPORTING COUNTRIES | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds | 1,000 pounds |
| British India..... | 8,002 | 267,887 | 7,536 | 344,142 | 7,297 | 350,970 | 7,839 | 375,949 | 10,164 | 364,671 |
| Ceylon..... | ¹ 189,016 | | 1 | 209,791 | | 0 217,184 | | 2 227,038 | | 236,719 |
| Dutch East Indies..... | 6,742 | 46,675 | 7,933 | 102,281 | 7,778 | 120,174 | 7,995 | 127,292 | ¹ 8,592 | ¹ 118,141 |
| China..... | 18,890 | 197,997 | 3,211 | 108,875 | 11,011 | 109,129 | 8,809 | 114,651 | 13,030 | 123,150 |
| Japan..... | 590 | 35,823 | 777 | 28,041 | 1,115 | 23,965 | 882 | 25,487 | 1,029 | 23,814 |
| Formosa..... | 68 | 23,640 | 29 | 21,028 | 57 | 22,412 | 83 | 22,156 | | |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United Kingdom..... | 293,045 | | 0 402,156 | | 0 410,986 | | 0 451,415 | | 0 419,945 | 0 |
| United States..... | 98,897 | | 0 100,962 | | 0 95,930 | | 0 89,169 | | 0 89,824 | 0 |
| Australia..... | 35,442 | | 0 349,935 | | 0 346,949 | | 0 349,672 | | 0 | 0 |
| Canada..... | 37,927 | | 0 37,392 | | 0 37,630 | | 0 38,117 | | 0 39,527 | 0 |
| Netherlands..... | 11,383 | 45 | 19,949 | 26 | 26,177 | 25 | 27,694 | 28 | 28,186 | 26 |
| Irish Free State..... | 0 | 0 | 22,611 | 0 | 23,596 | 0 | 23,667 | 0 | 22,649 | 0 |
| Russia..... | 157,704 | 866 | 23,303 | ³ 1,769 | 31,770 | ³ 1,300 | 33,741 | ³ 395 | 40,580 | |
| Persia ⁴ | 9,446 | 125 | 14,449 | 2,135 | 15,146 | 434 | 13,090 | 470 | | |
| New Zealand..... | 7,542 | 0 | 10,835 | 0 | 10,928 | 0 | 10,825 | 0 | 11,149 | 0 |
| Morocco..... | 6,696 | 0 | 12,020 | 0 | 11,184 | 0 | 11,333 | 0 | | |
| Union of South Africa..... | 5,192 | 61 | 9,815 | 8 | 10,303 | 127 | 11,812 | 164 | 11,585 | 133 |
| British Malaya..... | ³ 11,983 | ³ 5,318 | 9,127 | 1,301 | 11,198 | 1,533 | 10,778 | 1,238 | 9,973 | 1,317 |
| Egypt..... | 1,950 | 0 | 9,644 | 221 | 8,408 | 300 | 8,605 | 233 | 14,318 | 291 |
| Germany..... | 8,964 | 23 | 9,153 | 1 | 10,116 | 0 | 11,409 | 0 | 11,786 | 0 |
| Chile..... | 3,505 | 0 | 5,233 | 0 | 4,430 | 0 | 4,653 | 0 | 6,870 | 0 |
| Poland..... | 0 | 0 | 3,717 | 3 | 3,938 | 1 | 4,621 | 0 | 5,024 | 0 |
| Argentina..... | 3,890 | 0 | 4,071 | 0 | 2,739 | 0 | 4,101 | 0 | | |
| Indo-China..... | 3,295 | 1,145 | 4,060 | 2,281 | 5,592 | 2,530 | 5,071 | 1,711 | 5,098 | 2,065 |
| France..... | 2,806 | 61 | 3,841 | 125 | 3,570 | 108 | 3,022 | 48 | 3,338 | 55 |
| Czechoslovakia..... | 0 | 0 | 1,351 | 0 | 1,449 | 9 | 1,455 | 2 | 1,598 | 2 |
| Austria..... | ⁵ 3,424 | ⁵ 3 | 875 | 0 | 1,231 | 0 | 1,278 | 0 | 1,360 | 0 |
| Hungary..... | | | 621 | 1 | 646 | 23 | 884 | 0 | 924 | 0 |
| Total 28 countries..... | 737,384 | 768,685 | 774,607 | 822,029 | 801,174 | 850,228 | 842,022 | 894,862 | 756,549 | 870,384 |

Bureau of Agricultural Economics. Official sources except where otherwise noted.

¹ 2-year average.² Java and Madura only.³ International Yearbook of Agricultural Statistics.⁴ The figures shown are for the year ended Mar. 20 of the year following the date shown.⁵ Average for Austria-Hungary.

TABLE 506.—*Copra: International trade, years 1925-1928*

| Country | Year ended Dec. 31 | | | | | | | |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|---------------------|
| | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Imports | Exports | Imports | Exports | Imports | Exports | Imports | Exports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Dutch East Indies..... | 0 | 773,837 | 0 | 830,873 | 0 | 673,013 | 0 | 104,793 |
| Philippine Islands..... | 0 | 323,434 | 549 | 383,647 | 290 | 439,419 | 2,273 | 516,795 |
| British Malaya..... | 149,666 | 343,249 | 181,462 | 415,305 | 126,645 | 320,414 | 196,589 | 409,593 |
| Ceylon..... | 640 | 254,656 | 641 | 270,973 | 224 | 222,001 | 0 | 221,385 |
| Fiji..... | 0 | 54,058 | 0 | 62,424 | 0 | 59,494 | 0 | 62,601 |
| Solomon Islands ¹ | 0 | 43,276 | 0 | 50,012 | 0 | 0 | 0 | 0 |
| Zanzibar..... | 10,672 | 38,630 | 10,223 | 38,873 | 9,248 | 31,765 | 0 | 0 |
| Tonga ¹ | 0 | 30,818 | 0 | 31,342 | 0 | 0 | 0 | 0 |
| Mozambique..... | 0 | 38,300 | 0 | 39,827 | 0 | 38,412 | 0 | 41,684 |
| West Samoa ¹ | 0 | 32,522 | 0 | 27,438 | 0 | 26,129 | 0 | 0 |
| Tanganyika..... | 0 | 17,076 | 0 | 16,460 | 0 | 16,278 | 0 | 0 |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | |
| Germany..... | 379,511 | 578 | 438,087 | 1,434 | 413,295 | 310 | 442,593 | 16 |
| United States..... | 364,076 | 0 | 457,599 | 0 | 450,995 | 0 | 500,892 | 0 |
| France ¹ | 344,392 | 25 | 304,725 | 17 | 345,355 | 19 | 405,174 | 40 |
| Netherlands..... | 293,075 | 156 | 340,257 | 936 | 297,870 | 554 | 302,201 | 689 |
| Austria..... | 26,233 | 0 | 30,321 | 0 | 29,776 | 0 | 29,638 | 0 |
| Belgium..... | 19,140 | 260 | 21,684 | 30 | 12,386 | 121 | 13,628 | 101 |
| United Kingdom..... | 174,830 | 0 | 130,859 | 0 | 79,596 | 0 | 89,490 | 0 |
| Denmark..... | 108,142 | 0 | 107,000 | 0 | 111,519 | 0 | 136,083 | 0 |
| Australia ¹ | 71,871 | 0 | 78,659 | 0 | 79,772 | 0 | 0 | 0 |
| Italy..... | 56,743 | 16 | 51,709 | 7 | 61,779 | 12 | 58,688 | 4 |
| Sweden..... | 31,129 | 0 | 35,957 | 0 | 22,015 | 0 | 21,462 | 0 |
| Latvia..... | 2,956 | 0 | 3,051 | 0 | 2,824 | 0 | 3,649 | 0 |
| British India ¹ | 7,025 | 231 | 663 | 3,662 | 2,867 | 2,032 | 3,736 | 226 |
| Total 24 countries..... | 2,040,101 | 1,951,122 | 2,193,446 | 2,173,260 | 2,046,446 | 1,529,973 | 2,206,186 | 1,357,927 |

Bureau of Agricultural Economics. Compiled from official sources.

¹ From International Yearbook of Agricultural Statistics.² Java and Madura only.³ Includes some coconut.

TABLE 507.—Coconut oil: International trade, years 1924–1928

| Country | Year ended Dec. 31 | | | | | | | | | |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|---------------------|
| | 1924 | | 1925 | | 1926 | | 1927 | | 1928, preliminary | |
| | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports | Im- ports | Ex- ports |
| PRINCIPAL EXPORTING COUNTRIES | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> |
| Philippine Islands..... | 0 | 246,097 | 0 | 229,560 | 0 | 258,579 | 0 | 319,232 | 0 | 313,589 |
| Netherlands..... | 3,545 | 110,902 | 11,460 | 115,689 | 10,717 | 117,981 | 13,147 | 115,792 | 3,109 | 124,479 |
| Ceylon..... | 1 | 61,895 | 18 | 69,095 | 9 | 63,892 | 11 | 75,393 | ..... | 87,201 |
| France ¹ | 10,127 | 21,930 | 12,566 | 23,498 | 10,199 | 29,512 | 9,606 | 32,012 | 12,247 | 33,252 |
| British Malaya..... | 20 | 13,649 | 27 | 17,214 | 184 | 19,233 | 56 | 23,072 | 13 | 22,046 |
| Dutch East Indies..... | 7,042 | 15,773 | 9,632 | 20,606 | 10,376 | 32,812 | 764 | 19,413 | 27 | 273,299 |
| Germany..... | 19,192 | 5,817 | 12,812 | 17,512 | 4,139 | 15,076 | 2,355 | 27,305 | 13,791 | 41,956 |
| Australia ¹ | 173 | 421 | 382 | 413 | 232 | 450 | 255 | 398 | ..... | ..... |
| PRINCIPAL IMPORTING COUNTRIES | | | | | | | | | | |
| United States..... | 224,763 | 17,961 | 233,174 | 17,901 | 245,129 | 15,952 | 293,370 | 20,418 | 290,637 | 24,653 |
| United Kingdom..... | 52,886 | 7,074 | 68,723 | 5,914 | 82,510 | 6,068 | 91,349 | 5,535 | 141,145 | 9,072 |
| Belgium ¹ | 26,455 | 7,218 | 25,533 | 6,196 | 32,118 | 5,548 | 39,343 | 3,627 | 34,396 | 6,631 |
| Denmark..... | 24,466 | 17,176 | 38,321 | 10,836 | 32,533 | 17,859 | 19,126 | 22,132 | 23,539 | 33,420 |
| Sweden..... | 19,037 | 4,743 | 24,363 | 3,503 | 27,184 | 5,209 | 28,162 | 4,203 | 37,407 | 2,791 |
| Egypt..... | 10,882 | 0 | 12,067 | 0 | 10,200 | 1 | 10,905 | 2 | 11,502 | ..... |
| Italy ¹ | 11,485 | 56 | 6,807 | 245 | 5,450 | 42 | 7,633 | 55 | 12,679 | 138 |
| British India..... | 4,606 | 1,064 | 10,601 | 948 | 1,892 | 1,766 | 9,903 | 948 | 21,014 | 709 |
| Rumania..... | 963 | 0 | 1,869 | 0 | 1,026 | 0 | ..... | ..... | ..... | ..... |
| New Zealand..... | 331 | 0 | 720 | 0 | 778 | 0 | 981 | 0 | 814 | 0 |
| Portuguese-India ¹ | 8 | 1 | 190 | 0 | 34 | 0 | 10 | 9 | ..... | ..... |
| Total 19 countries..... | 415,982 | 531,777 | 460,265 | 539,130 | 474,710 | 589,980 | 526,976 | 669,546 | 602,480 | 773,296 |

Bureau of Agricultural Economics. Compiled from official sources.

¹ International Yearbook of Agricultural Statistics.² Java and Madura only.³ Includes some other oils.

MISCELLANEOUS AGRICULTURAL STATISTICS

TABLE 508.—Crop summary: Acreage, production, and yield per acre, 1927-1929

| Crop | Acreage | | | Unit | Production | | | Yield per acre | | |
|-------------------------------------|---------------------|---------------------|---------------------|-----------|---------------------|---------------------|------------|--------------------|--------------------|--------------------|
| | 1927 | 1928 | 1929 | | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | | Thou-sands | Thou-sands | Thou-sands | | | |
| Corn..... | 98,393 | 100,673 | 98,018 | Bushel.. | 2,763,093 | 2,818,901 | 2,622,189 | 28.1 | 28.0 | 26.8 |
| All wheat..... | 58,784 | 58,272 | 61,141 | do..... | 878,374 | 914,876 | 806,508 | 14.9 | 15.7 | 13.2 |
| Oats..... | 41,941 | 41,734 | 40,217 | do..... | 1,182,594 | 1,439,407 | 1,238,654 | 28.2 | 34.5 | 30.8 |
| Barley..... | 9,476 | 12,598 | 13,212 | do..... | 265,882 | 357,487 | 307,105 | 28.1 | 28.4 | 23.2 |
| Rye..... | 3,648 | 3,480 | 3,225 | do..... | 58,164 | 43,366 | 40,629 | 15.9 | 12.5 | 12.6 |
| Buckwheat..... | 810 | 749 | 729 | do..... | 15,755 | 13,148 | 11,505 | 19.5 | 17.6 | 15.8 |
| Flaxseed..... | 2,837 | 2,675 | 2,990 | do..... | 25,847 | 19,928 | 16,838 | 9.1 | 7.4 | 5.6 |
| Rice..... | 1,012 | 977 | 893 | do..... | 44,774 | 43,240 | 40,217 | 44.2 | 44.3 | 45.0 |
| Grain sorghums ¹ | 6,723 | 6,977 | 5,921 | do..... | 137,358 | 142,513 | 100,845 | 20.4 | 21.9 | 17.0 |
| Cotton..... | 40,138 | 45,341 | 45,981 | Bale..... | 12,955 | 14,478 | 14,919 | ² 154.5 | ² 152.9 | ² 155.3 |
| Cottonseed..... | | | | Ton..... | 5,759 | 6,435 | 6,030 | | | |
| Hay, tame..... | 60,885 | 58,140 | 60,996 | do..... | 106,001 | 93,351 | 101,715 | 1.74 | 1.61 | 1.67 |
| Hay, wild..... | 14,813 | 13,138 | 14,125 | do..... | 17,326 | 12,915 | 12,924 | 1.17 | .98 | .91 |
| All hay..... | 75,698 | 71,278 | 75,121 | do..... | 123,327 | 106,266 | 114,639 | 1.63 | 1.49 | 1.53 |
| Cloverseed (red alsike). | 1,214 | 617 | 1,369 | Bushel.. | 1,727 | 961 | 2,157 | 1.42 | 1.56 | 1.58 |
| Beans, dry, edible ¹ | 1,571 | 1,643 | 1,879 | do..... | 16,181 | 17,656 | 19,337 | 10.3 | 10.7 | 10.3 |
| Soybeans ² | 1,162 | 1,144 | 1,373 | do..... | 15,620 | 16,256 | 18,146 | 13.4 | 14.2 | 13.2 |
| Peanuts ³ | 1,786 | 1,930 | 2,024 | Pound.. | 1,312,643 | 1,276,078 | 1,360,277 | 735.0 | 661.2 | 672.1 |
| Cowpeas ⁴ | 1,826 | 1,391 | 1,059 | Bushel.. | 19,644 | 13,352 | 10,149 | 10.8 | 9.6 | 9.6 |
| Velvet beans ⁵ | 1,534 | 1,558 | 1,865 | Ton..... | 726 | 713 | 838 | ² 946.6 | ² 915.2 | ² 898.7 |
| Potatoes..... | 3,476 | 3,837 | 3,370 | Bushel.. | 402,741 | 465,350 | 357,451 | 115.9 | 121.3 | 106.1 |
| Sweet potatoes..... | 933 | 810 | 822 | do..... | 94,112 | 77,661 | 84,661 | 100.9 | 95.9 | 103.0 |
| Tobacco..... | 1,585 | 1,894 | 2,016 | Pound.. | 1,211,909 | 1,374,547 | 1,500,891 | 764.7 | 725.7 | 744.3 |
| Sugar cane, except for sirup (La.). | 90 | 131 | 190 | Ton..... | 1,178 | 2,099 | 3,040 | 13.2 | 16.0 | 16.0 |
| Cane sirup..... | 114 | 110 | 124 | Gallon.. | 20,839 | 20,401 | 23,458 | 182.8 | 185.5 | 189.2 |
| Sugar beets..... | 721 | 644 | 717 | Ton..... | 7,753 | 7,101 | 7,672 | 10.8 | 11.0 | 10.7 |
| Sorgo sirup..... | 366 | 349 | 346 | Gallon.. | 30,268 | 27,152 | 26,181 | 82.7 | 77.8 | 75.7 |
| Maple sugar and sirup (as sugar). | ⁴ 14,603 | ⁴ 14,388 | ⁴ 14,130 | Pound.. | 32,612 | 26,373 | 22,466 | ² 2.23 | ² 1.84 | ² 1.59 |
| Broomcorn ¹ | 237 | 298 | 284 | Ton..... | 40 | 54 | 44 | ² 337.6 | ² 363.1 | ² 308.5 |
| Hops ¹ | 25 | 26 | 25 | Pound.. | 30,658 | 32,944 | 33,220 | 1,246.0 | 1,257.0 | 1,334.0 |
| Fruit crops: | | | | | | | | | | |
| Apples, total..... | | | | Bushel.. | 123,693 | 186,893 | 139,754 | | | |
| Apples, commercial. | | | | Barrel.. | 26,017 | 35,461 | 28,973 | | | |
| Peaches..... | | | | Bushel.. | ⁶ 45,463 | ⁶ 68,369 | 45,998 | | | |
| Pears..... | | | | do..... | 18,373 | 24,212 | 20,903 | | | |
| Grapes..... | | | | Ton..... | ⁷ 2,635 | ⁷ 2,671 | 2,022 | | | |
| Oranges (2 States). | | | | Box..... | 31,200 | 53,705 | 33,100 | | | |
| Grapefruit (Fla.). | | | | do..... | 7,200 | 10,500 | 6,500 | | | |
| Lemons (Calif.) | | | | do..... | 6,000 | 7,900 | 5,900 | | | |
| Cranberries..... | 28 | 29 | 29 | Barrel.. | 496 | 551 | 542 | 17.4 | 19.3 | 19.0 |
| Commercial truck crops: | | | | | | | | | | |
| Asparagus..... | 90 | 97 | 99 | Crate.... | 7,861 | 9,433 | 9,887 | 87.0 | 98.0 | 100.0 |
| Beans, snap..... | 110 | 134 | 134 | Ton..... | 125 | 146 | 167 | 1.1 | 1.1 | 1.2 |
| Cabbage..... | 144 | 137 | 157 | do..... | 1,221 | 984 | 1,069 | 8.5 | 7.2 | 6.8 |
| Cantaloupes..... | 106 | 101 | 107 | Crate.... | 15,014 | 15,416 | 16,799 | 142.0 | 153.0 | 157.0 |
| Carrots..... | 26 | 28 | 31 | Bushel.. | 7,760 | 7,524 | 10,161 | 205.0 | 273.0 | 333.0 |
| Cauliflower..... | 18 | 21 | 25 | Crate.... | 4,173 | 5,031 | 6,450 | 232.0 | 235.0 | 254.0 |
| Celery..... | 25 | 27 | 29 | do..... | 7,585 | 7,624 | 8,686 | 300.0 | 282.0 | 302.0 |
| Corn, sweet (canning). | 223 | 306 | 331 | Ton..... | 414 | 593 | 639 | 1.9 | 1.9 | 1.9 |
| Cucumbers..... | 94 | 110 | 112 | Bushel.. | 8,294 | 8,656 | 8,644 | 89.0 | 79.0 | 77.0 |
| Eggplant..... | 3 | 4 | 4 | do..... | 814 | 896 | 713 | 263.0 | 230.0 | 196.0 |
| Lettuce..... | 123 | 125 | 141 | Crate.... | 19,369 | 18,382 | 20,325 | 157.0 | 147.0 | 144.0 |
| Onions..... | 78 | 80 | 87 | Bushel.. | 23,797 | 20,454 | 25,867 | 307.0 | 256.0 | 299.0 |
| Peas, green..... | 221 | 267 | 297 | Ton..... | 240 | 278 | 288 | 1.1 | 1.0 | .9 |
| Peppers..... | 15 | 18 | 18 | Bushel.. | 3,536 | 4,466 | 4,103 | 239.0 | 250.0 | 230.0 |
| Potatoes, early ⁸ | 348 | 401 | 289 | do..... | 44,827 | 55,475 | 35,613 | 129.0 | 138.0 | 123.0 |
| Spinach..... | 55 | 65 | 73 | Ton..... | 141 | 141 | 189 | 2.6 | 2.1 | 2.6 |
| Strawberries..... | 191 | 207 | 199 | Quart.. | 320,991 | 334,331 | 331,441 | 1,678.0 | 1,616.0 | 1,669.0 |
| Tomatoes..... | 394 | 400 | 434 | Ton..... | 1,628 | 1,394 | 1,846 | 4.1 | 3.5 | 4.2 |
| Watermelons..... | 183 | 207 | 204 | Number | 57,682 | 63,295 | 67,616 | 316.0 | 306.0 | 332.0 |
| Total with duplications eliminated. | 357,206 | 361,916 | 366,230 | | | | | | | |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Principal producing States.

² Pounds.

³ Includes total crop gathered, hogged off, and otherwise utilized, except where harvested for hay only.

⁴ Trees tapped.

⁵ Per tree.

⁶ The production of peaches shown includes some estimated quantities not harvested or not utilized as follows: 1927, 2,708,000 bushels; 1928, 3,917,000 bushels.

⁷ The production of grapes includes 142,000 tons not harvested in 1927; 153,000 tons not harvested in 1928.

⁸ Included in "Potatoes."

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TABLE 509.—*Acreage of 19 crops, by States, average 1920-1924, annual 1925-1929*

| State and division | Acreage of 19 crops ¹ | | | | | |
|---------------------|----------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | Average, 1920-1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
| | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> |
| Maine..... | 1,567 | 1,592 | 1,591 | 1,587 | 1,589 | 1,568 |
| New Hampshire..... | 520 | 523 | 523 | 519 | 511 | 512 |
| Vermont..... | 1,137 | 1,141 | 1,141 | 1,136 | 1,121 | 1,124 |
| Massachusetts..... | 568 | 573 | 575 | 568 | 560 | 562 |
| Rhode Island..... | 63 | 61 | 62 | 60 | 59 | 59 |
| Connecticut..... | 476 | 481 | 479 | 479 | 476 | 470 |
| New York..... | 8,048 | 7,841 | 7,621 | 7,638 | 7,397 | 7,397 |
| New Jersey..... | 861 | 708 | 686 | 684 | 681 | 681 |
| Pennsylvania..... | 7,689 | 7,314 | 7,150 | 7,129 | 7,007 | 6,900 |
| North Atlantic..... | 20,918 | 20,234 | 19,828 | 19,600 | 19,401 | 19,333 |
| Ohio..... | 11,255 | 10,751 | 10,651 | 10,402 | 10,282 | 10,370 |
| Indiana..... | 11,301 | 10,878 | 10,641 | 10,223 | 9,963 | 10,078 |
| Illinois..... | 20,162 | 20,131 | 19,774 | 19,201 | 19,788 | 19,808 |
| Michigan..... | 8,703 | 8,322 | 8,255 | 8,282 | 8,195 | 8,060 |
| Wisconsin..... | 9,589 | 9,534 | 9,502 | 9,507 | 9,455 | 9,449 |
| Minnesota..... | 16,897 | 17,923 | 17,868 | 17,682 | 17,469 | 17,671 |
| Iowa..... | 21,027 | 21,489 | 21,574 | 21,368 | 21,762 | 21,695 |
| Missouri..... | 14,738 | 14,525 | 13,997 | 13,137 | 13,778 | 13,280 |
| North Dakota..... | 19,104 | 20,452 | 19,453 | 20,140 | 20,802 | 20,678 |
| South Dakota..... | 15,458 | 15,918 | 13,629 | 16,383 | 15,697 | 16,996 |
| Nebraska..... | 18,511 | 19,674 | 19,486 | 20,306 | 20,280 | 20,802 |
| Kansas..... | 21,216 | 21,594 | 21,573 | 21,924 | 22,879 | 22,952 |
| North Central..... | 187,959 | 191,191 | 186,403 | 188,555 | 190,350 | 191,839 |
| Delaware..... | 396 | 344 | 346 | 339 | 344 | 340 |
| Maryland..... | 1,773 | 1,637 | 1,640 | 1,654 | 1,670 | 1,654 |
| Virginia..... | 4,446 | 4,208 | 4,232 | 4,104 | 4,119 | 3,988 |
| West Virginia..... | 1,848 | 1,794 | 1,744 | 1,742 | 1,727 | 1,724 |
| North Carolina..... | 6,635 | 6,821 | 6,960 | 6,692 | 6,728 | 6,735 |
| South Carolina..... | 5,418 | 5,076 | 4,982 | 5,027 | 4,868 | 4,661 |
| Georgia..... | 9,795 | 9,009 | 9,318 | 9,235 | 9,101 | 9,216 |
| Florida..... | 1,134 | 876 | 851 | 954 | 1,024 | 1,042 |
| South Atlantic..... | 31,445 | 29,765 | 30,073 | 29,747 | 29,581 | 29,360 |
| Kentucky..... | 5,747 | 5,354 | 5,323 | 5,151 | 5,262 | 5,325 |
| Tennessee..... | 6,513 | 6,388 | 6,726 | 6,278 | 6,208 | 6,471 |
| Alabama..... | 7,713 | 7,287 | 7,369 | 6,974 | 7,190 | 7,286 |
| Mississippi..... | 6,338 | 6,046 | 6,232 | 5,923 | 6,407 | 6,454 |
| Arkansas..... | 6,457 | 6,994 | 7,073 | 6,257 | 6,863 | 6,912 |
| Louisiana..... | 3,887 | 3,943 | 4,014 | 3,681 | 4,199 | 4,172 |
| Oklahoma..... | 14,625 | 15,210 | 15,900 | 14,719 | 15,678 | 15,423 |
| Texas..... | 25,202 | 26,546 | 30,257 | 29,344 | 30,059 | 30,870 |
| South Central..... | 76,481 | 77,768 | 82,894 | 78,327 | 81,866 | 82,913 |
| Montana..... | 6,223 | 6,662 | 6,772 | 7,457 | 7,626 | 7,841 |
| Idaho..... | 2,649 | 2,579 | 2,616 | 2,824 | 2,847 | 2,828 |
| Wyoming..... | 1,502 | 1,638 | 1,670 | 1,763 | 1,805 | 1,868 |
| Colorado..... | 5,455 | 5,608 | 5,934 | 5,688 | 5,881 | 5,939 |
| New Mexico..... | 1,111 | 904 | 1,287 | 972 | 1,213 | 1,403 |
| Arizona..... | 488 | 480 | 519 | 543 | 574 | 607 |
| Utah..... | 1,015 | 992 | 987 | 1,012 | 1,037 | 1,060 |
| Nevada..... | 384 | 421 | 402 | 405 | 407 | 405 |
| Washington..... | 3,795 | 3,486 | 3,475 | 3,611 | 3,602 | 3,777 |
| Oregon..... | 2,734 | 2,674 | 2,702 | 2,758 | 2,735 | 2,797 |
| California..... | 4,980 | 4,467 | 4,587 | 4,610 | 4,713 | 4,735 |
| Far Western..... | 30,335 | 29,911 | 30,951 | 31,643 | 32,440 | 33,260 |
| United States..... | 347,139 | 348,869 | 350,149 | 348,072 | 353,638 | 356,705 |

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

¹ Includes corn, wheat, oats, barley, rye, buckwheat, potatoes, sweetpotatoes, tobacco, flax, rice, all hay, cotton, peanuts, grain sorghums, beans, broomcorn, hops, and cranberries.

TABLE 510.—*Farm returns, 1922-1923*

[Averages of reports of owner-operators for their own farms for calendar year]

| | United States | | | | | | | North Atlantic | | East North Central | | West North Central | | South Atlantic | | South Central | | Western | |
|---|---------------|----------|----------|----------|----------|----------|----------|----------------|---------|--------------------|----------|--------------------|----------|----------------|---------|---------------|---------|----------|----------|
| | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1927 | 1928 | 1927 | 1928 | 1927 | 1928 | 1927 | 1928 | 1927 | 1928 | 1927 | 1928 |
| Number of reports..... | 6,094 | 16,183 | 15,103 | 15,330 | 13,475 | 13,859 | 11,851 | 1,477 | 1,244 | 2,560 | 2,343 | 3,129 | 2,735 | 1,937 | 1,525 | 3,419 | 2,737 | 1,438 | 1,247 |
| Size of farm—acres..... | 252 | 286 | 303 | 304 | 315 | 275 | 284 | 139 | 136 | 148 | 144 | 355 | 347 | 189 | 186 | 249 | 277 | 643 | 689 |
| Sales of farm real estate, Jan. 1..... | \$13,586 | \$14,530 | \$14,323 | \$14,157 | \$13,379 | \$12,543 | \$12,299 | \$9,405 | \$8,705 | \$13,023 | \$12,353 | \$19,082 | \$17,976 | \$8,231 | \$8,075 | \$8,895 | \$9,286 | \$14,982 | \$15,131 |
| Value of farm personalty, Jan. 1..... | 2,844 | 2,960 | 2,937 | 2,965 | 2,928 | 2,883 | 3,118 | 3,393 | 3,438 | 2,889 | 2,863 | 4,068 | 4,320 | 1,563 | 1,655 | 1,517 | 2,006 | 4,067 | 4,770 |
| Receipts: | | | | | | | | | | | | | | | | | | | |
| Crop sales..... | 816 | 850 | 1,012 | 993 | 926 | 978 | 946 | 983 | 786 | 605 | 510 | 826 | 911 | 1,005 | 901 | 1,068 | 1,163 | 1,721 | 1,600 |
| Sales of livestock..... | 660 | 760 | 780 | 897 | 894 | 851 | 936 | 448 | 494 | 966 | 867 | 1,562 | 3,711 | 364 | 413 | 444 | 489 | 1,104 | 1,431 |
| Sales of livestock products..... | 454 | 550 | 570 | 585 | 589 | 638 | 689 | 1,709 | 1,631 | 845 | 934 | 540 | 603 | 343 | 344 | 249 | 274 | 684 | 818 |
| Miscellaneous other..... | 42 | 80 | 72 | 76 | 39 | 38 | 37 | 68 | 60 | 36 | 35 | 42 | 42 | 30 | 25 | 21 | 20 | 50 | 59 |
| Total..... ^e | 1,972 | 2,240 | 2,434 | 2,551 | 2,448 | 2,505 | 2,608 | 3,208 | 2,971 | 2,452 | 2,346 | 2,970 | 3,267 | 1,742 | 1,683 | 1,782 | 1,936 | 3,550 | 3,908 |
| Cash outlay: | | | | | | | | | | | | | | | | | | | |
| Hired labor..... | 331 | 350 | 384 | 386 | 386 | 397 | 394 | 568 | 473 | 287 | 281 | 357 | 398 | 367 | 361 | 355 | 353 | 63 | 608 |
| Livestock bought..... | 204 | 240 | 222 | 242 | 242 | 238 | 238 | 210 | 200 | 279 | 183 | 338 | 399 | 137 | 162 | 130 | 145 | 27 | 323 |
| Feed bought..... | 175 | 210 | 248 | 244 | 232 | 243 | 262 | 596 | 611 | 258 | 288 | 292 | 290 | 125 | 125 | 98 | 115 | 24 | 202 |
| Fertilizer..... | 57 | 60 | 66 | 69 | 73 | 64 | 67 | 135 | 130 | 55 | 60 | 11 | 10 | 181 | 198 | 46 | 52 | 1 | 14 |
| Seed..... | 43 | 40 | 44 | 47 | 48 | 49 | 46 | 78 | 64 | 51 | 54 | 58 | 55 | 33 | 31 | 34 | 31 | 5 | 20 |
| Taxes on farm property..... | 174 | 190 | 192 | 191 | 183 | 180 | 184 | 169 | 163 | 213 | 216 | 235 | 238 | 111 | 114 | 114 | 115 | 24 | 263 |
| Machinery and tools..... | 123 | 110 | 103 | 116 | 130 | 129 | 151 | 141 | 130 | 131 | 125 | 190 | 255 | 57 | 57 | 74 | 85 | 20 | 254 |
| Miscellaneous other..... | 150 | 150 | 151 | 179 | 179 | 157 | 176 | 217 | 191 | 156 | 170 | 173 | 229 | 78 | 89 | 96 | 97 | 31 | 337 |
| Total..... | 1,257 | 1,350 | 1,410 | 1,477 | 1,473 | 1,457 | 1,518 | 2,114 | 1,962 | 1,430 | 1,377 | 1,674 | 1,864 | 1,089 | 1,137 | 972 | 993 | 1,982 | 2,210 |
| Receipts less cash outlay..... | 715 | 890 | 1,024 | 1,074 | 975 | 1,048 | 1,090 | 1,094 | 1,009 | 1,022 | 969 | 1,296 | 1,403 | 653 | 546 | 810 | 943 | 1,577 | 1,698 |
| Increase in inventory of personal property..... | 202 | 130 | 181 | 223 | 158 | 212 | 244 | 239 | 96 | 66 | 201 | 346 | 395 | 165 | 93 | 170 | 178 | 602 | 473 |
| Net result..... | 917 | 1,020 | 1,205 | 1,297 | 1,133 | 1,260 | 1,334 | 1,333 | 1,105 | 1,088 | 1,170 | 1,642 | 1,798 | 818 | 639 | 980 | 1,121 | 2,179 | 2,171 |
| Interest paid..... | (1) | 230 | 230 | 225 | 215 | 201 | 202 | 109 | 97 | 171 | 177 | 359 | 347 | 84 | 88 | 133 | 137 | 313 | 322 |
| Spent for farm improvements..... | (1) | 140 | 133 | 131 | 128 | 141 | 126 | 168 | 149 | 142 | 112 | 169 | 149 | 114 | 101 | 119 | 99 | 142 | 169 |

NONCASH (ESTIMATED) ITEMS

| | | | | | | | | | | | | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Value of food produced and used on the farm 1..... | \$294 | \$265 | \$274 | \$282 | \$273 | \$289 | \$286 | \$287 | \$266 | \$288 | \$284 | \$290 | \$207 | \$238 | \$256 | \$245 | \$247 | \$452 |
| Value of family labor, including owner 1..... | 716 | 870 | 789 | 793 | 779 | 768 | 941 | 902 | 842 | 837 | 919 | 932 | 489 | 462 | 505 | 514 | 1,024 | 1,008 |
| Change in value of real estate during the year (minus sign (-) shows decrease)..... | -52 | -66 | +145 | +173 | +2 | +61 | +72 | +66 | +64 | -23 | +26 | +71 | +52 | +74 | +58 | +79 | +171 | +267 |

Bureau of Agricultural Economics. Computed from reports of individual farms operated by their owners. Tables for 1922 in Agriculture Yearbook, 1924, pp. 1131-1132; tables for 1923-24 in Agriculture Yearbook, 1925, pp. 1342-1343; tables for 1925 in Agriculture Yearbook, 1927, pp. 1132-1133; tables for 1926 in Agriculture Yearbook 1928, pp. 1068-1069.

1 Not reported for 1922.

2 Averages of farms for which the item was reported.

TABLE 511.—Farm returns: Proportion of farmers obtaining net results within specified ranges, 1922-1928

| | United States | | | | | | | | | | | | North Atlantic | | East North Central | | West North Central | | South Atlantic | | South Central | | Western | | | | |
|--|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------|----------|--------------------|----------|--------------------|----------|----------------|----------|---------------|----------|----------|----------|----------|----------|--|
| | 1922 | | | 1923 | | | 1924 | | | 1925 | | | 1926 | | | 1927 | | | 1928 | | | 1927 | | | 1928 | | |
| | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | |
| Number of reports..... | 6,094 | 16,183 | 15,103 | 16,330 | 13,475 | 13,859 | 11,851 | 1,477 | 1,244 | 2,590 | 2,343 | 3,129 | 2,735 | 1,837 | 1,525 | 3,418 | 2,757 | 1,438 | 1,247 | | | | | | | | |
| Size of farm..... acres..... | 252 | 298 | 303 | 304 | 315 | 275 | 284 | 139 | 136 | 148 | 144 | 355 | 347 | 189 | 186 | 249 | 277 | 643 | 689 | | | | | | | | |
| Value of farm property Jan. 1 per farm..... dollars..... | 16,430 | 17,490 | 17,260 | 17,122 | 16,308 | 15,436 | 15,417 | 12,800 | 12,202 | 15,391 | 15,246 | 23,150 | 22,296 | 9,794 | 9,730 | 10,712 | 11,304 | 19,069 | 19,901 | | | | | | | | |
| Net result per farm..... do..... | 917 | 1,020 | 1,205 | 1,297 | 1,333 | 1,240 | 1,334 | 1,333 | 1,105 | 1,088 | 1,170 | 1,642 | 1,798 | 818 | 639 | 980 | 1,121 | 2,179 | 2,171 | | | | | | | | |
| Proportion obtaining: | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | |
| \$5,000 or more..... | 1.77 | 1.88 | 2.69 | 3.00 | 2.29 | 3.19 | 3.12 | 2.91 | 1.53 | 1.25 | 1.58 | 4.67 | 5.30 | 1.20 | 0.92 | 1.90 | 1.96 | 9.32 | 8.10 | | | | | | | | |
| \$3,000 to \$4,999..... | 3.89 | 4.67 | 6.10 | 6.82 | 5.49 | 6.42 | 6.77 | 7.38 | 5.55 | 4.49 | 4.78 | 10.00 | 12.29 | 2.78 | 1.57 | 4.33 | 4.50 | 10.64 | 10.99 | | | | | | | | |
| \$2,500 to \$2,999..... | 2.51 | 2.88 | 3.61 | 4.03 | 3.59 | 3.86 | 4.06 | 4.67 | 4.18 | 3.40 | 3.59 | 5.94 | 6.25 | 2.07 | 1.77 | 2.34 | 3.01 | 6.21 | 5.13 | | | | | | | | |
| \$2,000 to \$2,499..... | 4.33 | 5.13 | 5.99 | 6.26 | 5.46 | 6.53 | 6.35 | 7.52 | 6.43 | 7.07 | 6.70 | 8.82 | 8.70 | 3.86 | 2.36 | 4.50 | 4.93 | 7.70 | 9.38 | | | | | | | | |
| \$1,500 to \$1,999..... | 7.78 | 8.91 | 9.30 | 9.92 | 9.05 | 9.58 | 10.35 | 11.04 | 10.69 | 10.08 | 11.40 | 12.05 | 13.42 | 6.89 | 5.57 | 7.26 | 7.70 | 11.50 | 12.83 | | | | | | | | |
| \$1,000 to \$1,499..... | 14.39 | 14.49 | 15.13 | 15.44 | 14.09 | 15.46 | 15.23 | 16.06 | 14.55 | 17.42 | 17.41 | 16.23 | 17.55 | 13.55 | 10.62 | 13.63 | 14.07 | 15.85 | 14.92 | | | | | | | | |
| \$500 to \$999..... | 22.82 | 23.07 | 21.86 | 22.10 | 22.10 | 22.07 | 22.07 | 20.11 | 22.35 | 23.87 | 25.18 | 19.34 | 17.92 | 23.79 | 24.13 | 25.25 | 24.81 | 17.11 | 16.32 | | | | | | | | |
| \$0 to \$499..... | 27.98 | 26.09 | 24.68 | 22.32 | 26.43 | 23.98 | 23.19 | 19.90 | 23.54 | 23.01 | 21.60 | 15.79 | 13.46 | 34.70 | 34.76 | 31.77 | 30.76 | 15.92 | 16.25 | | | | | | | | |
| \$0 to -\$499..... | 9.89 | 9.10 | 7.85 | 7.81 | 8.56 | 6.68 | 7.20 | 7.51 | 8.84 | 7.07 | 6.41 | 4.38 | 3.98 | 9.74 | 15.08 | 7.11 | 7.11 | 5.15 | 4.57 | | | | | | | | |
| -\$500 to -\$999..... | 2.36 | 2.07 | 1.57 | 1.54 | 1.69 | 1.28 | 1.04 | 1.35 | 1.61 | 1.48 | .94 | 1.50 | .95 | 1.31 | 1.97 | .97 | .86 | 1.11 | .88 | | | | | | | | |
| -\$1,000 or more..... | 2.28 | 1.71 | 1.22 | 1.07 | 1.25 | .95 | .62 | .95 | .72 | .86 | .38 | 1.28 | .58 | .71 | 1.25 | .94 | .54 | .70 | .40 | | | | | | | | |
| | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | | |

Bureau of Agricultural Economics. The reports are those tabulated in Table 510 [preceding]. For distribution by geographical divisions, 1925 and 1926, see Table 476, Yearbook, 1927, and Table 509, Yearbook, 1928.

TABLE 512.—Gross value of farm production, 1924-1928

| State | Crops | | | | | Animal products | | | | |
|---------------------|---------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|
| | 1924 | 1925 | 1926 | 1927 | 1928 | 1924 | 1925 | 1926 | 1927 | 1928 |
| 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Maine..... | 61,614 | 105,152 | 83,653 | 76,707 | 54,254 | 32,963 | 32,963 | 31,999 | 31,853 | 30,931 |
| New Hampshire..... | 22,617 | 22,901 | 22,204 | 20,893 | 19,909 | 19,413 | 19,413 | 20,010 | 19,474 | 20,618 |
| Vermont..... | 45,164 | 43,976 | 41,988 | 38,621 | 36,251 | 40,763 | 40,763 | 39,765 | 41,851 | 41,338 |
| Massachusetts..... | 49,184 | 53,524 | 50,647 | 49,111 | 49,107 | 41,334 | 41,334 | 43,282 | 41,824 | 42,139 |
| Rhode Island..... | 5,482 | 5,709 | 5,686 | 5,046 | 4,841 | 6,156 | 6,156 | 6,161 | 6,356 | 6,732 |
| Connecticut..... | 39,999 | 39,613 | 39,144 | 37,939 | 38,137 | 32,960 | 32,960 | 35,039 | 34,680 | 35,787 |
| New York..... | 312,164 | 330,359 | 296,753 | 276,064 | 290,587 | 249,515 | 249,515 | 249,515 | 270,024 | 280,588 |
| New Jersey..... | 84,101 | 79,832 | 74,496 | 77,828 | 70,256 | 45,938 | 45,938 | 47,194 | 47,797 | 49,852 |
| Pennsylvania..... | 282,901 | 299,258 | 271,561 | 264,865 | 240,720 | 203,909 | 203,909 | 215,088 | 220,935 | 225,664 |
| Ohio..... | 334,247 | 331,856 | 325,685 | 304,427 | 290,937 | 284,506 | 284,506 | 286,746 | 278,183 | 279,601 |
| Indiana..... | 271,972 | 270,082 | 262,864 | 251,494 | 255,695 | 203,103 | 203,103 | 246,454 | 238,043 | 245,229 |
| Illinois..... | 486,165 | 456,165 | 441,843 | 507,877 | 507,877 | 315,697 | 315,697 | 380,369 | 352,400 | 348,283 |
| Michigan..... | 290,133 | 255,105 | 242,084 | 252,745 | 237,315 | 164,158 | 164,158 | 182,083 | 190,294 | 190,553 |
| Wisconsin..... | 287,534 | 313,649 | 295,866 | 295,102 | 287,976 | 271,525 | 271,525 | 346,619 | 353,726 | 341,444 |
| Minnesota..... | 397,878 | 356,464 | 334,650 | 336,685 | 327,396 | 264,027 | 264,027 | 346,029 | 320,240 | 341,603 |
| Iowa..... | 536,947 | 499,850 | 499,264 | 532,427 | 555,275 | 496,103 | 496,103 | 610,245 | 560,401 | 574,210 |
| Missouri..... | 364,902 | 339,542 | 306,163 | 311,162 | 309,755 | 246,906 | 246,906 | 311,432 | 297,227 | 306,666 |
| North Dakota..... | 343,119 | 278,447 | 192,880 | 281,798 | 241,946 | 87,520 | 87,520 | 89,938 | 82,509 | 87,497 |
| South Dakota..... | 245,143 | 187,135 | 127,742 | 259,386 | 173,491 | 133,773 | 133,773 | 163,548 | 150,708 | 160,111 |
| Nebraska..... | 374,678 | 319,074 | 265,660 | 421,041 | 342,671 | 245,949 | 245,949 | 303,551 | 284,542 | 296,350 |
| Kansas..... | 433,898 | 299,725 | 328,207 | 386,528 | 400,628 | 208,162 | 208,162 | 237,244 | 237,938 | 260,967 |
| Delaware..... | 19,346 | 19,100 | 16,852 | 18,700 | 20,099 | 7,920 | 7,920 | 9,393 | 9,597 | 9,957 |
| Maryland..... | 80,079 | 84,285 | 84,055 | 86,515 | 69,482 | 39,921 | 39,921 | 43,461 | 46,914 | 48,114 |
| Virginia..... | 212,995 | 184,128 | 198,331 | 215,039 | 202,004 | 77,680 | 77,680 | 81,359 | 80,519 | 93,375 |
| West Virginia..... | 84,397 | 85,557 | 84,053 | 81,500 | 82,616 | 42,998 | 42,998 | 51,122 | 52,582 | 55,287 |
| North Carolina..... | 361,407 | 376,911 | 370,082 | 390,590 | 359,212 | 72,246 | 72,246 | 81,649 | 80,751 | 86,550 |
| South Carolina..... | 197,877 | 186,604 | 173,598 | 190,115 | 167,123 | 35,961 | 35,961 | 34,938 | 36,425 | 37,108 |
| Georgia..... | 297,755 | 281,678 | 299,182 | 267,092 | 267,092 | 67,708 | 67,708 | 74,099 | 78,822 | 74,032 |
| Florida..... | 106,460 | 94,812 | 94,812 | 100,713 | 113,602 | 19,217 | 19,217 | 22,765 | 21,228 | 21,439 |
| Kentucky..... | 239,354 | 216,560 | 207,064 | 210,925 | 226,246 | 108,262 | 108,262 | 119,167 | 122,122 | 114,639 |
| Tennessee..... | 244,451 | 222,151 | 219,873 | 229,446 | 226,060 | 81,069 | 81,069 | 93,497 | 101,397 | 98,919 |
| Alabama..... | 232,286 | 266,465 | 225,667 | 265,472 | 228,781 | 54,011 | 54,011 | 59,409 | 64,602 | 57,118 |
| Mississippi..... | 232,756 | 334,121 | 239,506 | 297,247 | 248,746 | 55,081 | 55,081 | 55,106 | 56,275 | 54,354 |
| Arkansas..... | 150,953 | 200,387 | 151,939 | 222,036 | 232,028 | 53,068 | 53,068 | 65,929 | 65,963 | 66,866 |
| Louisiana..... | 395,365 | 309,577 | 313,023 | 301,495 | 306,469 | 31,695 | 31,695 | 33,969 | 31,956 | 31,776 |
| Oklahoma..... | 915,897 | 662,499 | 706,404 | 791,860 | 808,134 | 192,606 | 192,606 | 115,964 | 124,425 | 131,908 |
| Texas..... | 123,502 | 106,047 | 107,020 | 158,865 | 123,740 | 71,190 | 71,190 | 71,906 | 68,288 | 83,338 |
| Montana..... | 82,540 | 119,412 | 91,808 | 113,927 | 96,398 | 55,410 | 55,410 | 55,136 | 53,841 | 61,427 |
| Idaho..... | 28,808 | 31,897 | 30,061 | 32,248 | 34,067 | 40,012 | 40,012 | 40,535 | 41,247 | 45,215 |
| Wyoming..... | 127,372 | 135,384 | 120,671 | 132,212 | 117,463 | 77,946 | 77,946 | 79,065 | 81,786 | 89,811 |

| | | | | | | | | | | |
|--------------------|------------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| New Mexico..... | 36,526 | 26,677 | 30,712 | 26,618 | 30,540 | 30,499 | 29,992 | 34,847 | 37,134 | 39,328 |
| Arizona..... | 34,796 | 36,140 | 31,529 | 39,569 | 49,326 | 20,647 | 19,195 | 21,147 | 23,169 | 22,940 |
| Utah..... | 36,446 | 52,516 | 38,418 | 42,558 | 42,441 | 33,663 | 36,929 | 38,378 | 38,193 | 43,698 |
| Nevada..... | 9,154 | 11,421 | 8,274 | 7,811 | 8,365 | 15,960 | 16,370 | 16,902 | 15,475 | 17,200 |
| Washington..... | 128,765 | 170,503 | 151,120 | 172,983 | 150,418 | 62,663 | 73,704 | 72,500 | 75,058 | 80,312 |
| Oregon..... | 81,723 | 99,305 | 92,847 | 102,652 | 96,075 | 58,923 | 67,399 | 68,385 | 67,753 | 74,307 |
| California..... | 440,243 | 483,314 | 470,614 | 510,612 | 532,503 | 137,109 | 181,871 | 186,022 | 190,351 | 201,384 |
| United States..... | 10,513,262 | 9,989,859 | 9,261,501 | 10,070,351 | 9,726,822 | 5,083,582 | 5,819,224 | 6,054,632 | 5,979,781 | 6,154,884 |

Bureau of Agricultural Economics. Estimated quantities produced by States, times weighted annual prices, by States. Commodities included are those shown in Table 51d.

TABLE 513.—Gross income from farm production, 1924-1928

| State | Crops, gross | | | | | Animal production | | | | |
|----------------|--------------|---------|---------|---------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | 1924 | 1925 | 1926 | 1927 | 1928 | 1924 | 1925 | 1926 | 1927 | 1928 |
| Maine | 37,877 | 73,985 | 55,449 | 48,869 | 1,000 dollars 31,142 | 1,000 dollars 31,307 | 1,000 dollars 31,176 | 1,000 dollars 31,110 | 1,000 dollars 30,058 | 1,000 dollars 30,963 |
| New Hampshire | 11,886 | 12,852 | 11,772 | 10,968 | 10,035 | 19,172 | 19,078 | 19,176 | 18,733 | 19,733 |
| Vermont | 16,159 | 16,655 | 16,471 | 17,040 | 14,036 | 39,723 | 39,723 | 38,625 | 40,474 | 40,440 |
| Massachusetts | 33,384 | 37,247 | 35,181 | 34,021 | 34,243 | 40,226 | 41,503 | 41,503 | 39,814 | 40,507 |
| Rhode Island | 3,385 | 3,850 | 3,738 | 3,220 | 3,064 | 6,393 | 6,460 | 6,460 | 5,963 | 6,418 |
| Connecticut | 26,908 | 25,584 | 27,306 | 24,997 | 25,891 | 31,958 | 31,958 | 34,154 | 33,433 | 36,469 |
| New York | 170,846 | 188,617 | 164,198 | 153,091 | 149,073 | 221,120 | 240,277 | 239,333 | 267,250 | 267,250 |
| New Jersey | 64,510 | 63,810 | 58,381 | 62,284 | 54,867 | 44,175 | 45,155 | 45,155 | 47,688 | 47,688 |
| Pennsylvania | 128,126 | 156,443 | 132,589 | 123,327 | 112,791 | 184,692 | 199,351 | 207,190 | 207,553 | 217,724 |
| Ohio | 157,218 | 161,562 | 161,944 | 133,144 | 114,985 | 245,848 | 273,968 | 273,968 | 273,968 | 273,968 |
| Indiana | 118,994 | 127,235 | 125,424 | 95,119 | 89,359 | 209,459 | 228,477 | 235,562 | 228,990 | 243,005 |
| Illinois | 285,583 | 262,235 | 226,243 | 202,901 | 246,652 | 324,249 | 372,375 | 351,245 | 346,835 | 346,835 |
| Michigan | 131,141 | 136,305 | 121,262 | 114,356 | 114,887 | 162,170 | 173,222 | 183,032 | 182,997 | 186,221 |
| Wisconsin | 78,993 | 102,329 | 89,608 | 81,019 | 75,869 | 296,793 | 307,253 | 336,043 | 348,397 | 339,355 |
| Minnesota | 170,259 | 158,359 | 125,315 | 114,689 | 115,803 | 258,421 | 313,349 | 331,754 | 311,250 | 334,069 |
| Iowa | 132,060 | 147,923 | 135,231 | 122,490 | 166,896 | 262,944 | 294,474 | 310,061 | 292,833 | 303,895 |
| Missouri | 141,460 | 149,484 | 116,511 | 115,507 | 158,340 | 68,724 | 87,312 | 95,560 | 80,651 | 86,028 |
| North Dakota | 231,809 | 187,876 | 113,794 | 188,200 | 158,340 | 173,867 | 176,136 | 140,604 | 160,887 | 160,887 |
| South Dakota | 100,213 | 76,129 | 31,377 | 108,221 | 64,051 | 137,401 | 173,867 | 327,058 | 293,997 | 290,118 |
| Nebraska | 152,582 | 116,384 | 89,688 | 182,705 | 133,141 | 265,879 | 311,545 | 327,058 | 293,997 | 290,118 |
| Kansas | 261,949 | 150,442 | 203,247 | 205,138 | 233,779 | 211,853 | 230,974 | 254,304 | 220,972 | 247,317 |
| Delaware | 12,747 | 13,420 | 11,269 | 12,305 | 13,863 | 7,700 | 8,229 | 8,951 | 9,063 | 9,477 |
| Maryland | 49,521 | 56,338 | 55,686 | 55,566 | 41,315 | 83,615 | 81,342 | 40,807 | 43,726 | 45,564 |
| Virginia | 141,471 | 129,095 | 134,112 | 141,521 | 130,120 | 77,319 | 80,626 | 79,884 | 84,615 | 90,002 |
| West Virginia | 43,142 | 42,620 | 44,498 | 42,299 | 43,583 | 43,069 | 48,456 | 52,252 | 50,281 | 53,794 |
| North Carolina | 276,954 | 306,306 | 295,956 | 308,065 | 282,636 | 73,572 | 77,591 | 81,275 | 78,538 | 81,793 |
| South Carolina | 153,620 | 153,579 | 136,116 | 142,504 | 128,101 | 38,821 | 37,230 | 38,081 | 36,080 | 37,104 |
| Georgia | 218,016 | 218,288 | 194,914 | 216,283 | 193,789 | 70,566 | 77,478 | 76,305 | 76,305 | 76,305 |
| Florida | 94,314 | 93,056 | 84,526 | 89,652 | 103,343 | 21,248 | 20,960 | 23,214 | 21,660 | 22,558 |
| Kentucky | 131,747 | 126,983 | 104,550 | 102,149 | 103,888 | 102,496 | 112,691 | 116,983 | 118,820 | 117,520 |
| Tennessee | 145,758 | 126,529 | 131,892 | 131,892 | 134,534 | 83,633 | 97,349 | 96,969 | 98,470 | 100,462 |
| Alabama | 187,127 | 207,258 | 167,401 | 196,951 | 173,547 | 56,759 | 60,264 | 62,969 | 55,465 | 55,322 |
| Mississippi | 187,344 | 251,684 | 191,026 | 211,985 | 205,222 | 50,765 | 52,380 | 53,972 | 53,715 | 56,819 |
| Arkansas | 121,994 | 210,560 | 158,068 | 168,362 | 181,847 | 53,475 | 58,102 | 63,967 | 61,603 | 60,418 |
| Louisiana | 168,794 | 125,278 | 126,305 | 126,305 | 136,088 | 31,702 | 34,515 | 33,079 | 32,669 | 30,944 |
| Oklahoma | 293,245 | 246,835 | 233,574 | 204,414 | 220,000 | 87,702 | 111,065 | 104,778 | 128,368 | 128,368 |
| Texas | 740,878 | 558,246 | 549,260 | 625,276 | 610,733 | 197,092 | 219,541 | 239,831 | 256,422 | 243,817 |
| Montana | 75,371 | 61,283 | 64,517 | 98,804 | 76,933 | 76,933 | 76,933 | 76,933 | 76,933 | 76,933 |
| Idaho | 47,222 | 10,608 | 58,415 | 76,037 | 60,372 | 56,546 | 70,012 | 76,780 | 52,580 | 61,454 |
| Wyoming | 10,979 | 13,340 | 13,301 | 14,931 | 14,108 | 34,324 | 38,201 | 38,839 | 39,379 | 40,631 |
| Colorado | 75,416 | 79,824 | 80,604 | 82,285 | 68,411 | 68,411 | 68,411 | 68,411 | 68,411 | 68,411 |

| | | | | | | | | | | |
|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| New Mexico..... | 23,036 | 17,495 | 21,071 | 17,834 | 20,384 | 31,008 | 33,289 | 33,628 | 41,763 | 43,229 |
| Arizona..... | 27,322 | 28,513 | 25,099 | 31,355 | 40,490 | 22,223 | 25,344 | 24,245 | 26,249 | 30,422 |
| Utah..... | 21,193 | 34,048 | 23,234 | 24,750 | 25,239 | 35,028 | 36,051 | 36,663 | 37,023 | 42,175 |
| Nevada..... | 2,959 | 3,714 | 2,577 | 2,461 | 2,980 | 16,338 | 16,557 | 18,365 | 15,691 | 17,886 |
| Washington..... | 94,149 | 130,258 | 113,217 | 132,580 | 111,696 | 60,388 | 72,909 | 70,881 | 72,323 | 77,979 |
| Oregon..... | 53,648 | 67,076 | 65,149 | 71,016 | 63,222 | 58,540 | 68,731 | 67,311 | 66,041 | 72,283 |
| California..... | 361,564 | 400,767 | 404,010 | 446,080 | 456,907 | 166,543 | 180,247 | 178,445 | 190,690 | 197,970 |
| United States..... | 6,245,794 | 6,230,471 | 5,531,376 | 5,919,948 | 5,757,484 | 5,165,940 | 5,821,049 | 6,011,059 | 5,797,349 | 6,070,225 |

Bureau of Agricultural Economics. Estimated quantities sold and consumed in farm households, by States, times weighted annual prices, by States. Commodities included are those shown in Table 516.

TABLE 514.—Gross income and cash income from farm production, 1924-1928

| State | Gross income—Crops and animal products | | | | | Cash income—Crops and animal products | | | | |
|---------------------|--|----------------|----------------|----------------|----------------|---------------------------------------|----------------|----------------|----------------|----------------|
| | 1924 | 1925 | 1926 | 1927 | 1928 | 1924 | 1925 | 1926 | 1927 | 1928 |
| | 1,000 dollars. | 1,000 dollars. | 1,000 dollars. | 1,000 dollars. | 1,000 dollars. | 1,000 dollars. | 1,000 dollars. | 1,000 dollars. | 1,000 dollars. | 1,000 dollars. |
| Maine..... | 98,019 | 105,292 | 86,625 | 79,919 | 60,996 | 55,142 | 89,770 | 71,908 | 65,660 | 47,155 |
| New Hampshire..... | 30,464 | 31,201 | 29,988 | 29,731 | 20,988 | 24,769 | 25,566 | 25,515 | 24,212 | 24,212 |
| Vermont..... | 51,133 | 56,378 | 55,066 | 57,514 | 54,476 | 43,358 | 47,533 | 46,986 | 48,979 | 64,220 |
| Massachusetts..... | 73,610 | 77,138 | 76,084 | 74,750 | 73,885 | 63,009 | 65,883 | 66,963 | 63,106 | 64,131 |
| Rhode Island..... | 9,378 | 10,187 | 9,198 | 9,213 | 9,512 | 8,097 | 8,984 | 8,878 | 8,005 | 8,269 |
| Connecticut..... | 56,784 | 57,542 | 61,460 | 58,430 | 60,160 | 48,751 | 52,904 | 52,904 | 50,023 | 51,187 |
| New York..... | 391,966 | 428,874 | 403,331 | 416,323 | 404,551 | 342,352 | 370,933 | 349,896 | 350,677 | 363,965 |
| New Jersey..... | 105,604 | 107,985 | 103,536 | 107,672 | 102,555 | 97,034 | 97,812 | 93,515 | 98,096 | 92,877 |
| Pennsylvania..... | 312,818 | 335,824 | 339,788 | 330,860 | 330,515 | 244,943 | 278,207 | 267,499 | 259,793 | 261,103 |
| Delaware..... | 402,702 | 435,550 | 440,391 | 404,341 | 391,270 | 330,328 | 354,210 | 361,948 | 329,370 | 317,264 |
| Ohio..... | 328,483 | 355,712 | 360,986 | 324,109 | 332,364 | 276,251 | 294,620 | 301,202 | 269,650 | 277,076 |
| Indiana..... | 606,892 | 627,957 | 598,618 | 554,146 | 593,511 | 542,039 | 584,032 | 522,451 | 488,762 | 528,145 |
| Illinois..... | 293,311 | 309,587 | 304,394 | 297,353 | 301,108 | 243,320 | 250,142 | 250,146 | 244,905 | 250,416 |
| Michigan..... | 345,786 | 409,612 | 425,711 | 429,416 | 415,224 | 297,946 | 330,155 | 201,478 | 376,274 | 364,833 |
| Wisconsin..... | 428,680 | 471,708 | 457,069 | 425,939 | 449,872 | 379,683 | 412,237 | 401,005 | 372,045 | 394,983 |
| Minnesota..... | 644,713 | 721,123 | 744,640 | 691,628 | 729,313 | 594,919 | 651,943 | 674,800 | 625,229 | 663,947 |
| Iowa..... | 404,404 | 443,958 | 426,992 | 408,340 | 414,328 | 335,874 | 356,859 | 340,577 | 326,523 | 338,322 |
| Missouri..... | 300,533 | 275,188 | 293,354 | 268,851 | 244,368 | 279,928 | 238,832 | 183,187 | 246,055 | 222,371 |
| North Dakota..... | 237,614 | 249,996 | 207,513 | 248,825 | 224,948 | 217,835 | 239,825 | 379,268 | 227,172 | 202,525 |
| South Dakota..... | 418,461 | 427,929 | 416,746 | 432,702 | 432,259 | 388,611 | 356,093 | 412,038 | 382,492 | 377,177 |
| Nebraska..... | 473,802 | 401,416 | 457,351 | 426,130 | 481,086 | 433,017 | 356,093 | 412,038 | 382,492 | 377,177 |
| Kansas..... | 20,447 | 21,649 | 20,250 | 21,368 | 22,280 | 17,416 | 18,198 | 17,032 | 16,202 | 17,153 |
| Delaware..... | 88,136 | 97,680 | 96,493 | 99,292 | 86,879 | 79,404 | 79,038 | 78,038 | 81,800 | 69,892 |
| Maryland..... | 213,790 | 210,621 | 213,946 | 226,136 | 220,122 | 184,423 | 148,220 | 151,899 | 162,981 | 153,593 |
| Virginia..... | 86,211 | 91,085 | 95,730 | 92,380 | 97,377 | 51,811 | 55,723 | 60,482 | 57,223 | 62,124 |
| West Virginia..... | 330,526 | 338,877 | 377,231 | 386,603 | 364,489 | 294,820 | 294,952 | 289,300 | 302,449 | 276,870 |
| North Carolina..... | 192,441 | 190,809 | 172,197 | 178,384 | 165,205 | 143,753 | 142,512 | 124,522 | 130,969 | 116,596 |
| South Carolina..... | 288,882 | 351,060 | 272,687 | 292,386 | 270,510 | 207,523 | 209,149 | 189,893 | 214,514 | 192,843 |
| Georgia..... | 115,952 | 124,071 | 111,312 | 111,312 | 103,091 | 103,091 | 101,008 | 94,728 | 99,389 | 113,837 |
| Florida..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Kentucky..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Tennessee..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Alabama..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Mississippi..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Arkansas..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Louisiana..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Oklahoma..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Texas..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Idaho..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Montana..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Wyoming..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Utah..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Washington..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Oregon..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| California..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Alaska..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Hawaii..... | 224,453 | 234,713 | 220,369 | 245,098 | 245,098 | 163,455 | 163,455 | 146,528 | 151,097 | 177,118 |
| Canada..... | 143,909 | 150,978 | 163,725 | 159,929 | 155,086 | 131,468 | 147,061 | 149,960 | 146,402 | 142,001 |
| New Mexico..... | 54,044 | 50,754 | 54,699 | 59,587 | 63,613 | 48,213 | 44,768 | 48,960 | 53,808 | 58,088 |

| | | | | | | | | | | |
|--------------------|------------|------------|------------|------------|------------|-----------|------------|-----------|-----------|------------|
| Arizona..... | 43,545 | 53,857 | 48,344 | 60,604 | 70,912 | 46,214 | 50,325 | 45,331 | 56,394 | 66,610 |
| Utah..... | 56,221 | 70,069 | 58,397 | 61,773 | 67,414 | 50,826 | 63,757 | 54,331 | 56,184 | 61,615 |
| Nevada..... | 19,297 | 20,271 | 20,942 | 18,132 | 20,896 | 18,161 | 18,990 | 19,692 | 16,995 | 19,594 |
| Washington..... | 154,537 | 203,167 | 184,048 | 204,903 | 189,673 | 137,595 | 184,449 | 167,252 | 188,128 | 172,679 |
| Oregon..... | 112,188 | 135,807 | 132,400 | 137,067 | 135,503 | 90,052 | 121,128 | 119,050 | 124,062 | 123,167 |
| California..... | 528,107 | 581,014 | 584,055 | 626,770 | 694,877 | 507,555 | 558,540 | 563,347 | 606,051 | 635,042 |
| United States..... | 11,411,731 | 12,051,520 | 11,542,435 | 11,717,297 | 11,827,709 | 9,703,021 | 10,160,415 | 9,715,007 | 9,966,481 | 10,071,555 |

Bureau of Agricultural Economics. Estimated quantities sold, by States, times weighted annual prices, by States. Gross income equals cash income plus value of quantities consumed in farm households times weighted annual prices. Commodities included are those shown in Table 516.

TABLE 515.—Cash income from farm production, 1924-1928

| State | Crops | | | | | Animal production | | | | |
|---------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | 1924 | 1925 | 1926 | 1927 | 1928 | 1924 | 1925 | 1926 | 1927 | 1928 |
| Maine..... | 1,000 dollars 30,402 | 1,000 dollars 64,993 | 1,000 dollars 47,346 | 1,000 dollars 23,576 | 1,000 dollars 24,740 | 1,000 dollars 24,562 | 1,000 dollars 16,777 | 1,000 dollars 16,990 | 1,000 dollars 24,431 | 1,000 dollars 23,579 |
| New Hampshire..... | 8,105 | 8,525 | 7,786 | 6,837 | 16,740 | 16,543 | 16,644 | 16,990 | 24,431 | 23,579 |
| Vermont..... | 11,365 | 11,045 | 11,320 | 12,026 | 9,279 | 16,776 | 16,543 | 16,990 | 24,431 | 23,579 |
| Massachusetts..... | 27,773 | 31,179 | 29,714 | 28,607 | 26,693 | 36,279 | 36,438 | 35,266 | 36,933 | 36,941 |
| Rhode Island..... | 2,773 | 3,203 | 3,173 | 2,681 | 2,520 | 5,781 | 5,705 | 5,705 | 5,781 | 5,781 |
| Connecticut..... | 23,043 | 21,038 | 23,250 | 21,113 | 22,002 | 27,506 | 27,506 | 27,506 | 27,506 | 27,506 |
| New York..... | 148,626 | 139,987 | 129,217 | 126,451 | 193,726 | 209,909 | 209,909 | 209,909 | 209,909 | 209,909 |
| New Jersey..... | 60,973 | 59,030 | 58,942 | 58,056 | 50,516 | 38,782 | 38,782 | 38,782 | 38,782 | 38,782 |
| Pennsylvania..... | 96,023 | 131,687 | 100,112 | 92,242 | 82,083 | 158,520 | 158,520 | 158,520 | 158,520 | 158,520 |
| Ohio..... | 129,375 | 107,721 | 133,849 | 108,456 | 88,982 | 222,903 | 222,903 | 222,903 | 222,903 | 222,903 |
| Indiana..... | 101,721 | 107,904 | 107,578 | 78,846 | 72,630 | 186,716 | 186,716 | 186,716 | 186,716 | 186,716 |
| Illinois..... | 263,447 | 202,880 | 202,558 | 181,960 | 226,167 | 313,152 | 313,152 | 313,152 | 313,152 | 313,152 |
| Michigan..... | 108,301 | 73,211 | 96,385 | 90,851 | 135,019 | 143,272 | 143,272 | 143,272 | 143,272 | 143,272 |
| Wisconsin..... | 56,896 | 135,989 | 105,622 | 97,132 | 241,080 | 276,944 | 276,944 | 276,944 | 276,944 | 276,944 |
| Minnesota..... | 114,170 | 126,310 | 113,639 | 103,622 | 148,874 | 254,733 | 254,733 | 254,733 | 254,733 | 254,733 |
| Iowa..... | 111,137 | 118,377 | 86,239 | 86,701 | 214,737 | 288,462 | 288,462 | 288,462 | 288,462 | 288,462 |
| Missouri..... | 226,786 | 181,959 | 108,373 | 183,569 | 153,994 | 153,142 | 153,142 | 153,142 | 153,142 | 153,142 |
| North Dakota..... | 95,541 | 70,717 | 26,474 | 103,988 | 59,519 | 156,138 | 156,138 | 156,138 | 156,138 | 156,138 |
| South Dakota..... | 144,374 | 105,939 | 80,738 | 174,304 | 125,169 | 283,266 | 283,266 | 283,266 | 283,266 | 283,266 |
| Nebraska..... | 251,280 | 139,583 | 192,791 | 195,050 | 224,523 | 216,456 | 216,456 | 216,456 | 216,456 | 216,456 |
| Kansas..... | 11,220 | 11,603 | 9,810 | 10,800 | 9,346 | 6,196 | 6,196 | 6,196 | 6,196 | 6,196 |
| Delaware..... | 41,974 | 48,036 | 48,146 | 48,451 | 34,120 | 29,430 | 30,890 | 30,792 | 33,349 | 35,842 |
| Maryland..... | 110,410 | 101,597 | 106,346 | 114,525 | 101,004 | 44,013 | 46,623 | 45,463 | 48,456 | 52,290 |
| Virginia..... | 24,336 | 23,960 | 27,134 | 25,313 | 26,629 | 31,314 | 31,314 | 31,314 | 31,314 | 31,314 |
| West Virginia..... | 237,623 | 267,190 | 257,527 | 272,301 | 244,375 | 27,197 | 27,197 | 27,197 | 27,197 | 27,197 |
| North Carolina..... | 120,943 | 131,380 | 115,037 | 122,538 | 106,973 | 13,790 | 10,838 | 9,345 | 30,148 | 32,401 |
| South Carolina..... | 184,855 | 183,408 | 162,544 | 185,697 | 161,320 | 23,269 | 25,741 | 27,349 | 29,736 | 31,621 |
| Georgia..... | 87,959 | 86,891 | 78,771 | 84,031 | 97,660 | 14,117 | 15,955 | 15,358 | 16,177 | 16,177 |
| Florida..... | 103,912 | 113,706 | 99,371 | 76,989 | 103,290 | 64,311 | 69,122 | 74,098 | 74,098 | 74,098 |
| Tennessee..... | 114,343 | 113,706 | 99,371 | 104,442 | 104,138 | 43,301 | 49,889 | 52,679 | 53,103 | 53,103 |
| Alabama..... | 157,825 | 139,151 | 170,632 | 170,038 | 145,012 | 19,567 | 19,567 | 19,567 | 19,567 | 19,567 |
| Mississippi..... | 163,307 | 257,941 | 168,614 | 190,281 | 181,721 | 26,745 | 26,745 | 26,745 | 26,745 | 26,745 |
| Arkansas..... | 174,937 | 168,641 | 135,391 | 146,648 | 158,630 | 20,584 | 22,863 | 22,863 | 22,863 | 22,863 |
| Louisiana..... | 107,178 | 154,953 | 113,643 | 117,443 | 124,454 | 13,090 | 16,892 | 16,892 | 16,892 | 16,892 |
| Oklahoma..... | 281,541 | 233,186 | 220,933 | 191,923 | 207,010 | 43,240 | 43,240 | 43,240 | 43,240 | 43,240 |
| Texas..... | 712,811 | 530,071 | 622,133 | 600,065 | 613,323 | 137,539 | 137,539 | 137,539 | 137,539 | 137,539 |
| Montana..... | 72,028 | 57,724 | 61,468 | 73,131 | 57,142 | 67,884 | 67,884 | 67,884 | 67,884 | 67,884 |
| Idaho..... | 43,063 | 12,314 | 55,300 | 73,131 | 57,142 | 67,884 | 67,884 | 67,884 | 67,884 | 67,884 |
| Wyoming..... | 9,863 | 12,314 | 12,352 | 14,047 | 13,144 | 35,223 | 35,223 | 35,223 | 35,223 | 35,223 |
| Colorado..... | 72,371 | 70,465 | 77,659 | 79,506 | 63,560 | 70,566 | 70,566 | 70,566 | 70,566 | 70,566 |

| | | | | | | | | | | |
|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| New Mexico..... | 21,505 | 15,821 | 19,613 | 16,515 | 19,018 | 26,708 | 28,947 | 29,086 | 37,263 | 39,040 |
| Arizona..... | 26,547 | 27,590 | 23,963 | 30,045 | 39,039 | 19,667 | 22,735 | 21,368 | 26,348 | 27,551 |
| Utah..... | 19,266 | 31,602 | 21,405 | 22,969 | 23,210 | 31,570 | 32,155 | 32,936 | 33,215 | 38,405 |
| Nevada..... | 2,782 | 3,504 | 2,445 | 2,346 | 2,821 | 13,379 | 15,476 | 17,247 | 14,640 | 16,773 |
| Washington..... | 86,597 | 122,234 | 106,345 | 125,648 | 104,716 | 50,998 | 62,215 | 60,997 | 62,480 | 67,963 |
| Oregon..... | 47,612 | 60,744 | 59,520 | 65,721 | 57,608 | 51,440 | 60,384 | 59,530 | 58,341 | 64,559 |
| California..... | 354,522 | 393,604 | 397,914 | 439,430 | 450,241 | 153,033 | 164,936 | 165,433 | 166,621 | 194,801 |
| United States..... | 5,566,107 | 5,503,156 | 4,856,340 | 5,283,042 | 5,101,814 | 4,136,914 | 4,657,239 | 4,836,667 | 4,683,439 | 4,969,741 |

Bureau of Agricultural Economics. Estimated quantities sold, by States, times weighted annual prices, by States. Commodities included are those shown in Table 516.

TABLE 516.—Gross value, gross income, and cash income from farm production, United States, 1924-1928

| Products | Gross value | | | | Gross income | | | | Cash income | | | | | | |
|----------------------------------|-------------|-----------|-----------|-----------|--------------|-----------|-----------|-----------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 1924 | 1925 | 1926 | 1927 | 1928 | 1924 | 1925 | 1926 | 1927 | 1928 | 1924 | 1925 | 1926 | 1927 | 1928 |
| CROPS | | | | | | | | | | | | | | | |
| Corn..... | 2,438,945 | 2,046,550 | 2,023,249 | 2,365,302 | 2,341,462 | 429,061 | 386,482 | 324,312 | 408,124 | 423,417 | 387,614 | 362,152 | 302,692 | 382,224 | 306,056 |
| Wheat..... | 1,082,931 | 972,481 | 1,014,854 | 1,047,127 | 900,754 | 925,383 | 801,175 | 861,799 | 875,616 | 764,621 | 911,216 | 788,599 | 845,504 | 862,173 | 752,642 |
| Oats..... | 719,653 | 584,482 | 506,687 | 563,119 | 597,490 | 217,498 | 150,428 | 181,784 | 116,180 | 146,696 | 217,498 | 150,428 | 117,264 | 116,180 | 146,696 |
| Barley..... | 133,046 | 131,655 | 107,602 | 183,999 | 204,751 | 61,842 | 55,365 | 36,767 | 72,920 | 86,401 | 61,842 | 55,365 | 36,767 | 72,920 | 84,401 |
| Rye..... | 62,728 | 37,585 | 34,401 | 49,068 | 36,002 | 36,002 | 27,903 | 24,119 | 38,621 | 26,730 | 40,896 | 27,903 | 23,773 | 38,248 | 26,377 |
| Buckwheat..... | 14,341 | 12,235 | 11,002 | 13,318 | 11,794 | 10,769 | 9,480 | 8,132 | 10,507 | 8,851 | 9,729 | 8,526 | 7,296 | 9,670 | 7,992 |
| Rice..... | 44,564 | 49,268 | 45,621 | 42,168 | 37,319 | 41,698 | 45,231 | 42,365 | 40,558 | 35,644 | 41,542 | 42,356 | 40,549 | 35,836 | 33,536 |
| Grain sorghums..... | 99,766 | 80,251 | 74,065 | 104,712 | 93,433 | 16,894 | 12,135 | 14,360 | 28,072 | 18,749 | 16,694 | 12,135 | 14,360 | 28,072 | 18,749 |
| Emmer and spelt..... | 3,191 | 2,313 | 1,278 | 3,213 | 2,450 | 276 | 190 | 82 | 269 | 181 | 196 | 190 | 82 | 269 | 181 |
| Popcorn..... | 1,285 | 3,676 | 1,181 | 1,314 | 1,303 | 1,285 | 3,676 | 1,181 | 1,314 | 1,303 | 1,285 | 3,676 | 1,181 | 1,314 | 1,303 |
| Cotton lint..... | 1,561,025 | 1,577,396 | 1,121,222 | 1,314,063 | 1,300,502 | 1,561,025 | 1,577,396 | 1,121,222 | 1,314,063 | 1,300,502 | 1,561,025 | 1,577,396 | 1,121,222 | 1,314,063 | 1,300,502 |
| Cottonseed..... | 206,190 | 220,381 | 172,134 | 206,971 | 227,895 | 148,613 | 162,543 | 130,027 | 156,157 | 170,974 | 148,613 | 162,543 | 130,027 | 156,157 | 170,974 |
| Tobacco..... | 259,139 | 250,774 | 236,702 | 256,875 | 276,448 | 259,139 | 250,774 | 236,702 | 256,875 | 276,448 | 259,139 | 250,774 | 236,702 | 256,875 | 276,448 |
| Potatoes, white..... | 315,200 | 531,689 | 500,743 | 456,456 | 383,679 | 257,868 | 430,685 | 406,185 | 382,890 | 234,380 | 196,284 | 337,233 | 324,204 | 306,554 | 180,659 |
| Sweetpotatoes..... | 82,068 | 103,941 | 98,483 | 102,588 | 88,675 | 79,644 | 101,212 | 96,239 | 100,817 | 86,730 | 93,062 | 72,352 | 75,054 | 81,027 | 66,735 |
| Truck crops..... | 302,671 | 346,833 | 287,597 | 308,231 | 326,926 | 302,671 | 346,833 | 287,597 | 308,231 | 326,926 | 302,671 | 346,833 | 287,597 | 308,231 | 301,960 |
| Hay..... | 1,413,193 | 1,254,585 | 1,283,419 | 1,264,620 | 1,182,960 | 236,131 | 204,045 | 192,622 | 179,969 | 178,638 | 236,131 | 204,045 | 192,622 | 179,969 | 178,638 |
| Sweet sorghum forage..... | 32,610 | 28,226 | 29,973 | 36,290 | 26,748 | 3,053 | 2,373 | 2,782 | 3,534 | 2,852 | 3,053 | 2,373 | 2,782 | 3,534 | 2,852 |
| Flaxseed..... | 68,725 | 58,746 | 39,252 | 49,737 | 37,316 | 65,191 | 47,253 | 36,183 | 46,943 | 34,297 | 65,191 | 47,253 | 36,183 | 46,943 | 34,297 |
| Broom corn..... | 7,454 | 4,219 | 4,285 | 4,212 | 4,850 | 7,454 | 4,219 | 4,285 | 4,212 | 4,850 | 7,454 | 4,219 | 4,285 | 4,212 | 4,850 |
| Hemp..... | 71 | 195 | 116 | 116 | 116 | 163 | 224 | 116 | 116 | 116 | 163 | 224 | 116 | 116 | 116 |
| Hops..... | 3,415 | 6,232 | 7,296 | 7,024 | 6,328 | 7,024 | 6,232 | 7,296 | 7,024 | 6,328 | 7,024 | 6,232 | 7,296 | 7,024 | 6,328 |
| Alfalfa seed..... | 11,231 | 11,825 | 9,645 | 9,315 | 7,026 | 10,246 | 10,222 | 8,608 | 7,365 | 10,822 | 10,246 | 10,222 | 8,608 | 7,365 | 5,975 |
| Clover seed, red and alsike..... | 13,311 | 16,295 | 13,181 | 27,327 | 18,399 | 10,515 | 13,346 | 9,778 | 24,558 | 15,277 | 10,515 | 13,346 | 9,778 | 24,558 | 15,277 |
| Clover seed, sweet and lap..... | 5,868 | 5,903 | 6,834 | 6,327 | 4,168 | 4,041 | 4,220 | 6,486 | 4,694 | 4,229 | 6,486 | 4,229 | 6,486 | 4,694 | 2,966 |
| Timothy seed..... | 8,828 | 6,561 | 6,834 | 5,424 | 2,977 | 8,373 | 6,400 | 6,480 | 5,173 | 2,712 | 8,373 | 6,400 | 6,480 | 5,173 | 2,712 |
| Field beans..... | 49,280 | 52,470 | 41,383 | 50,346 | 68,181 | 44,694 | 48,324 | 38,041 | 45,944 | 62,395 | 44,694 | 48,324 | 38,041 | 45,944 | 61,865 |
| Soybeans..... | 23,147 | 23,431 | 21,808 | 28,050 | 26,768 | 7,034 | 5,958 | 5,843 | 6,510 | 5,958 | 7,034 | 5,958 | 5,843 | 6,510 | 6,447 |
| Cow peas..... | 31,317 | 34,552 | 28,843 | 36,896 | 26,948 | 4,749 | 4,439 | 4,390 | 4,272 | 3,065 | 4,749 | 4,439 | 4,390 | 4,272 | 3,065 |
| Peanuts..... | 44,435 | 39,490 | 32,376 | 47,122 | 39,213 | 39,883 | 35,732 | 29,304 | 42,015 | 34,435 | 39,883 | 35,732 | 29,304 | 42,015 | 34,435 |
| Vetch beans..... | 13,545 | 9,636 | 11,991 | 14,520 | 14,805 | 188,923 | 199,066 | 199,066 | 188,923 | 193,189 | 188,923 | 199,066 | 199,066 | 188,923 | 154,942 |
| Apples..... | 206,450 | 215,050 | 211,896 | 173,741 | 200,582 | 198,644 | 207,785 | 199,066 | 188,923 | 193,189 | 188,923 | 199,066 | 199,066 | 188,923 | 154,942 |
| Peaches..... | 68,084 | 64,171 | 68,426 | 50,494 | 63,649 | 65,713 | 67,506 | 64,687 | 64,687 | 60,253 | 64,687 | 64,687 | 60,253 | 64,687 | 38,424 |
| Pears..... | 26,899 | 29,066 | 29,399 | 24,268 | 24,167 | 28,800 | 28,196 | 21,508 | 23,569 | 23,569 | 21,000 | 23,569 | 21,000 | 23,569 | 19,624 |
| Plums..... | 70,251 | 66,198 | 64,603 | 65,332 | 49,101 | 69,134 | 65,299 | 63,621 | 64,036 | 48,100 | 64,741 | 61,390 | 60,260 | 61,390 | 45,092 |
| Grapes..... | 7,485 | 6,370 | 5,623 | 6,069 | 7,743 | 6,485 | 6,370 | 5,623 | 6,069 | 7,743 | 6,485 | 6,370 | 5,623 | 6,069 | 7,743 |
| Cranberries..... | 53,859 | 50,512 | 58,373 | 59,379 | 53,711 | 53,859 | 50,512 | 58,373 | 59,379 | 53,711 | 53,859 | 50,512 | 58,373 | 59,379 | 53,186 |
| Strawberries..... | 28,109 | 28,311 | 32,615 | 36,557 | 31,680 | 28,109 | 28,311 | 32,615 | 36,557 | 31,680 | 28,109 | 28,311 | 32,615 | 36,557 | 31,680 |
| Other berries..... | 28,449 | 7,031 | 6,772 | 36,892 | 7,031 | 28,449 | 7,031 | 6,772 | 36,892 | 7,031 | 28,449 | 7,031 | 6,772 | 36,892 | 7,031 |
| Pears..... | 91,338 | 89,864 | 104,062 | 115,313 | 142,265 | 91,338 | 89,864 | 104,062 | 115,313 | 142,265 | 91,338 | 89,864 | 104,062 | 115,313 | 142,265 |

MISCELLANEOUS AGRICULTURAL STATISTICS

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| | | | | | | | | | | | | | | | |
|----------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|-----------|-----------|------------|
| Grapefruit..... | 7,620 | 16,855 | 11,146 | 19,456 | 18,901 | 7,620 | 16,855 | 11,146 | 19,456 | 18,901 | 7,542 | 16,739 | 11,068 | 19,321 | 18,791 |
| Other fruits..... | 64,818 | 69,463 | 70,285 | 74,603 | 81,931 | 64,510 | 69,283 | 78,816 | 74,468 | 81,466 | 60,007 | 58,903 | 73,903 | 70,719 | 70,966 |
| Other nuts..... | 12,042 | 19,080 | 12,450 | 20,968 | 17,818 | 12,942 | 19,860 | 12,450 | 20,968 | 15,826 | 12,837 | 15,826 | 12,942 | 20,870 | 13,714 |
| Maple sirup and sugar..... | 8,285 | 7,629 | 9,802 | 9,168 | 17,526 | 7,283 | 7,629 | 9,802 | 9,168 | 7,596 | 8,093 | 6,658 | 8,508 | 8,028 | 6,608 |
| Sugar beets..... | 50,324 | 50,453 | 50,940 | 50,524 | 50,940 | 50,524 | 47,137 | 50,940 | 50,453 | 50,940 | 50,940 | 47,137 | 50,940 | 49,455 | 50,940 |
| Sugar cane and sirup..... | 27,444 | 23,836 | 24,862 | 24,718 | 24,862 | 24,718 | 24,862 | 24,862 | 24,718 | 24,862 | 24,862 | 24,862 | 24,862 | 24,862 | 24,862 |
| Sorghum sirup..... | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 | 23,379 |
| Farm gardens..... | 285,379 | 301,583 | 284,349 | 285,082 | 303,651 | 285,379 | 301,583 | 284,349 | 285,082 | 303,651 | 7,411 | 7,484 | 9,219 | 8,041 | 7,768 |
| Nursery products..... | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 | 20,432 |
| Forest products..... | 306,427 | 311,091 | 317,881 | 309,832 | 311,091 | 306,427 | 311,091 | 317,881 | 309,832 | 311,091 | 177,897 | 189,524 | 184,201 | 179,578 | 180,205 |
| Greenhouse products..... | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 | 76,839 |
| Total..... | 10,513,262 | 9,889,859 | 9,281,501 | 10,070,581 | 9,726,822 | 6,245,791 | 6,220,471 | 5,531,376 | 5,919,948 | 5,757,484 | 5,566,107 | 5,503,156 | 4,856,340 | 5,283,042 | 5,101,814 |
| ANIMAL PRODUCTS | | | | | | | | | | | | | | | |
| Cattle and calves..... | 817,492 | 878,901 | 869,504 | 940,727 | 1,137,176 | 921,682 | 1,002,954 | 1,010,030 | 1,005,770 | 1,194,474 | 885,397 | 974,105 | 982,922 | 975,233 | 1,080,124 |
| Hogs..... | 1,186,053 | 1,598,320 | 1,753,645 | 1,570,027 | 1,387,122 | 1,323,975 | 1,666,402 | 1,757,628 | 1,506,949 | 1,477,721 | 1,088,016 | 1,340,688 | 1,413,332 | 1,203,929 | 1,208,865 |
| Sheep and lambs..... | 148,803 | 173,568 | 174,872 | 177,508 | 197,406 | 133,966 | 152,612 | 155,876 | 130,962 | 171,463 | 131,145 | 140,487 | 152,948 | 147,628 | 108,081 |
| Poultry (chickens)..... | 371,333 | 410,827 | 462,333 | 457,823 | 444,208 | 390,991 | 408,088 | 445,631 | 449,314 | 457,464 | 229,574 | 253,710 | 274,729 | 261,350 | 279,864 |
| Eggs..... | 609,638 | 722,925 | 735,323 | 698,218 | 746,285 | 583,562 | 691,897 | 704,037 | 639,868 | 717,103 | 430,312 | 519,929 | 545,934 | 490,318 | 560,238 |
| Milk..... | 1,767,266 | 1,852,191 | 1,896,855 | 2,005,087 | 2,061,464 | 1,677,561 | 1,758,841 | 1,804,605 | 1,910,545 | 1,965,338 | 1,231,776 | 1,302,654 | 1,359,099 | 1,469,154 | 1,500,962 |
| Wool..... | 87,401 | 97,245 | 88,485 | 96,240 | 109,299 | 87,401 | 97,245 | 88,485 | 86,240 | 108,299 | 87,401 | 97,245 | 88,485 | 86,240 | 108,299 |
| Mohair..... | 6,509 | 5,790 | 7,219 | 7,537 | 10,228 | 6,509 | 5,790 | 7,219 | 7,537 | 10,228 | 6,509 | 5,790 | 7,219 | 7,537 | 10,228 |
| Bee products..... | 11,597 | 11,934 | 11,129 | 12,490 | 9,493 | 11,597 | 11,934 | 11,129 | 12,490 | 9,493 | 8,088 | 8,358 | 7,678 | 9,376 | 6,527 |
| Horses..... | 50,921 | 44,736 | 38,056 | 38,028 | 36,998 | 16,163 | 14,749 | 16,227 | 14,973 | 15,406 | 16,163 | 14,749 | 16,227 | 14,973 | 15,406 |
| Mules..... | 26,467 | 22,787 | 17,211 | 16,066 | 15,205 | 12,533 | 10,537 | 10,194 | 12,701 | 12,216 | 12,533 | 10,537 | 10,194 | 12,701 | 12,216 |
| Total..... | 5,083,582 | 5,819,224 | 6,054,632 | 5,979,781 | 6,154,894 | 5,165,940 | 5,821,049 | 6,011,059 | 5,797,349 | 6,070,225 | 4,136,914 | 4,637,259 | 4,838,067 | 4,683,439 | 4,969,741 |
| Grand total..... | 15,596,844 | 15,709,083 | 15,336,133 | 16,050,362 | 15,881,716 | 11,411,731 | 12,041,520 | 11,542,435 | 11,717,287 | 11,827,709 | 9,703,021 | 10,140,415 | 9,715,007 | 9,966,481 | 10,071,555 |

Bureau of Agricultural Economics. Estimated quantities produced, sold, and consumed in farm households times weighted annual prices. Cash income plus value of commodities consumed in farm households equals gross income. For feed and seed crops, horses and mules, values include sales by farmers in some States eventually bought by farmers in other States. These inter-farm sales tend to overstate the total income from farm production for the country as a whole.

TABLE 517.—*Wheat: Cost of production, by yield groups, 1928*

| Yield group (bushels per acre) | Reports | Average acres in wheat per farm | Average yield per acre | Gross cost per acre | | | | | | | Credit per acre (straw) | Net cost | | | |
|---------------------------------|---------|--|---------------------------------|-------------------------|--------------------------|---------|--|-------------------------------|---------|--------------|----------------------------------|---------------------------------|-----------------|-------------|---------------|
| | | | | Prepare and plant | Harvest and thresh | Market | Miscel- laneous labor ¹ | Ferti- lizer and manure | Seed | Land rent | | Miscel- laneous ² | Total | Per acre | Per bushel |
| | Number | Acres | Bushels | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| Winter-wheat belt: ³ | | | | | | | | | | | | | | | |
| 12 and under..... | 114 | 115 | 9 | 3.10 | 3.30 | 0.68 | 0.08 | 0.74 | 1.39 | 3.84 | 1.82 | 14.95 | 0.36 | 14.59 | 1.62 |
| 13 to 18..... | 165 | 128 | 16 | 3.14 | 4.06 | .82 | .05 | .90 | 1.36 | 4.35 | 2.04 | 16.72 | 3 32 | 16.40 | 1.02 |
| 19 to 24..... | 138 | 103 | 21 | 3.41 | 4.55 | .96 | .12 | .64 | 1.39 | 5.04 | 2.35 | 18.46 | .36 | 18.10 | .96 |
| 25 and over..... | 85 | 117 | 28 | 3.37 | 5.16 | 1.05 | .11 | .63 | 1.41 | 6.80 | 2.25 | 20.78 | .38 | 20.40 | .73 |
| Total or average..... | 502 | 117 | 18 | 3.24 | 4.20 | .87 | .09 | .75 | 1.39 | 4.86 | 2.11 | 17.51 | .35 | 17.16 | .95 |
| Spring-wheat belt: ⁴ | | | | | | | | | | | | | | | |
| 12 and under..... | 135 | 130 | 9 | 2.88 | 2.95 | .77 | .14 | .14 | 1.55 | 2.58 | 1.83 | 12.84 | .17 | 12.67 | 1.41 |
| 13 to 18..... | 119 | 147 | 16 | 3.22 | 3.70 | .96 | .14 | .33 | 1.67 | 3.48 | 1.96 | 15.46 | .25 | 15.21 | .95 |
| 19 and over..... | 95 | 129 | 22 | 3.48 | 4.57 | 1.31 | .27 | .33 | 1.71 | 4.08 | 2.40 | 18.15 | .38 | 17.77 | .81 |
| Total or average..... | 349 | 136 | 15 | 3.15 | 3.64 | .98 | .18 | .25 | 1.63 | 3.25 | 2.04 | 15.12 | .26 | 14.86 | .99 |

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters. For figures for 1923, 1924, 1925, 1926, and 1927, see Agriculture Yearbooks, 1924, p. 1183; 1925, p. 1328; 1926, p. 1210; 1927, p. 1136; and 1928, p. 1041.

¹ Includes miscellaneous labor, irrigating and water, seed treatment, and material.

² Includes sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.

³ Winter-wheat belt as used here includes Kansas, Nebraska, Missouri, and Oklahoma.

⁴ Spring-wheat belt as used here includes western Minnesota, North Dakota, eastern South Dakota, and eastern Montana.

TABLE 518.—*Corn: Cost of production, by yield groups, 1928*

| Yield group (bushels per acre) | Reports | Average acreage in corn per farm | Average yield per acre | Gross cost per acre | | | | | | | | | | Net cost | | |
|--------------------------------|---------|----------------------------------|------------------------|---------------------|----------------|---------|---------|--------------------------|-------------------------------|---------|--------------|--------------------|---------|---|----------|---------------|
| | | | | Prepare and plant | Culti- vate | Harvest | Market | Miscel- laneous labor | Fertil- izer and manure | Seed | Land rent | Miscel- laneous | Total | Credit per acre (stover and fodder) | Per acre | Per bushel |
| | Number | Acres | Bushels | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| All reports: | 123 | 46 | 4 | 3.41 | 2.69 | 1.19 | 0.54 | 0.12 | 2.25 | 0.43 | 3.48 | 1.89 | 16.00 | 1.14 | 14.86 | 3.72 |
| 7 and under: | 631 | 36 | 13 | 3.48 | 3.06 | 1.77 | 1.16 | .05 | 1.89 | .36 | 4.10 | 1.91 | 17.78 | .93 | 16.85 | 1.30 |
| 8 to 17: | 624 | 36 | 22 | 3.06 | 3.34 | 2.52 | 1.68 | .06 | 2.79 | .42 | 4.70 | 1.89 | 21.36 | 1.40 | 19.96 | .91 |
| 18 to 27: | 924 | 36 | 32 | 4.03 | 3.02 | 3.32 | 1.90 | .15 | 2.95 | .47 | 5.62 | 2.06 | 23.52 | 1.69 | 21.83 | .68 |
| 28 to 37: | 769 | 40 | 41 | 4.48 | 3.07 | 4.39 | 2.17 | .11 | 3.56 | .52 | 6.78 | 2.31 | 27.39 | 2.11 | 25.28 | .62 |
| 38 to 47: | 672 | 40 | 41 | 4.48 | 3.34 | 5.20 | 2.54 | .19 | 4.90 | .55 | 7.85 | 2.61 | 31.96 | 2.38 | 29.58 | .59 |
| 48 to 57: | 422 | 44 | 50 | 4.88 | 3.34 | 6.34 | 3.11 | .14 | 6.88 | .58 | 8.24 | 3.03 | 37.45 | 3.06 | 34.39 | .51 |
| 58 and over: | 249 | 33 | 67 | 5.47 | 3.66 | | | | | | | | | | | |
| All groups: | 3,790 | 39 | 31 | 4.17 | 3.18 | 3.42 | 1.89 | .10 | 3.20 | .46 | 5.70 | 2.16 | 24.37 | 1.72 | 22.65 | .73 |
| Corn Belt: ¹ | | | | | | | | | | | | | | | | |
| 17 and under: | 45 | 36 | 12 | 3.62 | 2.70 | 2.07 | .90 | ----- | 2.73 | .37 | 3.83 | 1.85 | 18.16 | 1.58 | 16.58 | 1.38 |
| 18 to 27: | 115 | 54 | 25 | 3.76 | 2.72 | 2.45 | 1.19 | .04 | 2.09 | .39 | 4.35 | 1.69 | 18.71 | .98 | 17.73 | .77 |
| 28 to 37: | 218 | 54 | 32 | 3.60 | 2.50 | 2.95 | 1.56 | .12 | 2.15 | .41 | 5.90 | 1.96 | 21.15 | 1.02 | 20.13 | .63 |
| 38 to 47: | 283 | 63 | 41 | 3.85 | 2.45 | 3.28 | 1.75 | .04 | 1.95 | .45 | 7.21 | 1.88 | 22.86 | .99 | 21.87 | .53 |
| 48 to 57: | 204 | 68 | 51 | 4.22 | 2.98 | 4.05 | 2.10 | .07 | 2.25 | .48 | 8.15 | 2.28 | 26.58 | 1.10 | 25.48 | .50 |
| 58 and over: | 97 | 54 | 65 | 4.29 | 2.77 | 4.87 | 2.39 | .05 | 3.56 | .51 | 8.74 | 2.69 | 29.87 | 1.25 | 28.62 | .44 |
| Total or average: | 942 | 59 | 40 | 3.92 | 2.65 | 3.41 | 1.76 | .07 | 2.30 | .44 | 6.79 | 2.04 | 23.38 | 1.09 | 22.29 | .56 |

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters. For figures for 1923, 1924, 1925, 1926, and 1927, see *Agriculture Yearbooks, 1924*, p. 1135; 1925, p. 1332; 1926, p. 1213; 1927, p. 1133; and 1928, p. 1044.

¹ Includes miscellaneous labor, irrigating, and water.

² Includes sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.
³ Corn Belt as used here includes Indiana, Illinois, Iowa, western Ohio, southeast corner of South Dakota, eastern Nebraska, northeast corner of Kansas, and the northern three-fourths of Missouri.

TABLE 519.—Oats: Cost of production, by yield groups, 1923

| Yield group (bushels per acre) | Reports | Average acres in oats per farm | Average yield per acre | Gross cost per acre | | | | | | | | Net cost | | | |
|--------------------------------|---------|---|------------------------------|-------------------------|----------------------|---------|--|-------------------------------|---------|--------------|---------------------------------|----------|-------------------------------|-------------|---------------|
| | | | | Prepare and plant | Harvest ¹ | Market | Miscel- laneous labor ¹ | Fertil- izer and manure | Seed | Land rent | Miscel- laneous ² | Total | Credit per acre (straw) | Per acre | Per bushel |
| | Number | Acres | Bushels | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 17 and under | 159 | 23 | 11 | 2.96 | 2.51 | 0.60 | 0.17 | 0.70 | 1.45 | 3.35 | 1.70 | 13.44 | 0.82 | 12.62 | 1.15 |
| 18 to 22 | 248 | 26 | 20 | 3.09 | 3.62 | .99 | .13 | 1.31 | 1.50 | 4.05 | 1.94 | 16.63 | 1.05 | 15.58 | .78 |
| 23 to 27 | 190 | 28 | 25 | 3.47 | 3.77 | 1.06 | .11 | 1.34 | 1.58 | 4.27 | 2.09 | 17.69 | 1.38 | 16.31 | .64 |
| 28 to 32 | 445 | 28 | 30 | 3.27 | 4.12 | 1.18 | .16 | 1.13 | 1.51 | 4.65 | 2.15 | 18.17 | 1.56 | 16.61 | .55 |
| 33 to 37 | 283 | 27 | 35 | 3.43 | 4.31 | 1.26 | .12 | 1.40 | 1.59 | 5.12 | 2.36 | 19.59 | 1.80 | 17.79 | .51 |
| 38 to 42 | 531 | 27 | 40 | 3.56 | 4.67 | 1.41 | .16 | 1.44 | 1.60 | 5.81 | 2.46 | 21.11 | 1.65 | 19.46 | .49 |
| 43 to 47 | 168 | 29 | 45 | 3.61 | 5.01 | 1.53 | .32 | 1.20 | 1.60 | 6.30 | 2.80 | 22.37 | 2.23 | 20.14 | .45 |
| 48 to 52 | 312 | 28 | 50 | 3.59 | 5.27 | 1.72 | .20 | 1.55 | 1.58 | 6.23 | 2.66 | 22.80 | 2.19 | 20.61 | .41 |
| 53 to 57 | 78 | 29 | 55 | 3.46 | 5.26 | 1.53 | .16 | 1.31 | 1.57 | 6.87 | 2.86 | 23.02 | 2.41 | 20.61 | .37 |
| 58 to 62 | 123 | 21 | 60 | 3.98 | 5.97 | 1.88 | .38 | 1.83 | 1.78 | 7.38 | 2.83 | 26.03 | 3.07 | 22.96 | .38 |
| 63 and over | 84 | 28 | 71 | 3.66 | 6.22 | 2.27 | .37 | 1.85 | 1.68 | 9.20 | 3.34 | 28.59 | 3.34 | 25.25 | .36 |

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters. For figures for 1922, 1924, 1925, 1926, and 1927, see Agriculture Yearbooks, 1924, p. 1137; 1925, p. 1335; 1926, p. 1217; 1927, p. 1143; and 1928, p. 1048.

¹ Threshing is included under harvesting.

² Includes miscellaneous labor, irrigating and water, seed treatment, and material.

³ Sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.

TABLE 520.—Cotton: Cost of production, by yield groups, 1928

| Yield group (pounds of lint per acre) | Reports | Average acreage in cotton per farm | Average yield of lint per acre | Gross cost per acre | | | | | | | | | | Net cost of lint | | |
|---------------------------------------|---------|------------------------------------|--------------------------------|---------------------|-------------|--------------------|------------------------------------|-------------------------|---------|---------|-----------|------------------------------|---------|-------------------------------|----------|-----------|
| | | | | Prepare and plant | Culti- vate | Harvest and market | Miscel- laneous labor ¹ | Fertil- izer and manure | Seed | Ginning | Land rent | Miscel- laneous ² | Total | Credit per acre (cotton-seed) | Per acre | Per pound |
| | Number | Acres | Pounds | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| 60 and under..... | 25 | 31 | 43 | 4.25 | 5.18 | 2.87 | 0.19 | 3.84 | 1.56 | 0.56 | 3.50 | 2.19 | 24.14 | 1.75 | 22.39 | 0.52 |
| 61 to 100..... | 111 | 62 | 88 | 3.66 | 5.37 | 3.91 | .32 | 3.74 | 1.08 | .96 | 3.96 | 2.10 | 25.10 | 2.98 | 22.12 | .26 |
| 101 to 140..... | 125 | 44 | 125 | 3.86 | 5.37 | 5.54 | .18 | 4.67 | 1.28 | 1.39 | 4.18 | 2.37 | 28.84 | 4.11 | 24.73 | .20 |
| 141 to 180..... | 186 | 55 | 162 | 4.11 | 5.52 | 6.53 | .33 | 4.72 | 1.21 | 1.82 | 4.73 | 2.51 | 31.48 | 5.33 | 26.15 | .16 |
| 181 to 220..... | 154 | 58 | 200 | 4.25 | 6.49 | 8.05 | .46 | 4.95 | 1.31 | 2.26 | 5.56 | 2.62 | 35.95 | 6.25 | 29.70 | .15 |
| 221 to 260..... | 208 | 56 | 246 | 4.31 | 6.32 | 9.32 | .48 | 5.91 | 1.27 | 2.63 | 6.49 | 2.59 | 39.33 | 8.06 | 31.27 | .13 |
| 261 to 300..... | 122 | 67 | 291 | 4.97 | 7.44 | 10.60 | .50 | 6.61 | 1.33 | 3.11 | 6.67 | 3.02 | 44.25 | 9.02 | 35.23 | .12 |
| 301 to 340..... | 35 | 23 | 328 | 4.72 | 6.22 | 10.06 | .74 | 6.38 | 1.08 | 3.46 | 7.44 | 2.31 | 42.41 | 9.56 | 32.85 | .10 |
| 341 to 380..... | 45 | 44 | 360 | 4.73 | 6.72 | 12.50 | .30 | 7.46 | 1.18 | 3.92 | 6.84 | 2.55 | 46.20 | 10.23 | 35.97 | .10 |
| 381 to 420..... | 45 | 26 | 402 | 5.01 | 6.18 | 12.08 | .37 | 8.37 | 1.44 | 4.20 | 7.81 | 3.50 | 48.96 | 11.47 | 37.49 | .09 |
| 421 to 460..... | 20 | 28 | 421 | 5.78 | 8.78 | 13.26 | .71 | 7.16 | 1.50 | 4.47 | 8.30 | 3.01 | 51.92 | 13.04 | 38.88 | .09 |
| 461 to 500..... | 30 | 27 | 497 | 5.81 | 7.45 | 15.26 | .91 | 9.75 | 1.65 | 4.89 | 8.30 | 3.70 | 57.72 | 14.81 | 42.91 | .09 |
| 501 and over..... | 13 | 12 | 647 | 4.46 | 6.80 | 19.44 | 1.86 | 8.08 | 1.23 | 6.72 | 10.96 | 3.17 | 62.52 | 16.37 | 45.95 | .07 |

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

* Includes miscellaneous labor, irrigating and water, dusting, and dusting material.

* Includes picking sacks and sheets, crop insurance, use of implements, use of storage buildings, and overhead.

TABLE 521.—*Cotton: Cost of production, by yield groups, 1924-1928*

| Yield group (pounds of lint per acre) ¹ | Farms reporting | | | | | Average yield of lint per acre | | | | | Net cost of lint per pound ² | | | | |
|--|-----------------|--------|--------|--------|--------|--------------------------------|--------|--------|--------|--------|---|--------|--------|-------|-------|
| | 1925 | | 1926 | | 1927 | 1928 | 1924 | | 1925 | | 1926 | | 1927 | | 1928 |
| | Number | Number | Number | Number | Number | Number | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Cents | Cents |
| 60 and under..... | 24 | 47 | 32 | 45 | 25 | 36 | 34 | 36 | 34 | 41 | 37 | 43 | 51 | 71 | 59 |
| 61 to 100..... | 107 | 79 | 91 | 72 | 111 | 93 | 89 | 87 | 89 | 87 | 87 | 88 | 27 | 31 | 28 |
| 101 to 140..... | 186 | 112 | 114 | 90 | 125 | 125 | 126 | 125 | 126 | 126 | 126 | 125 | 21 | 21 | 20 |
| 141 to 180..... | 284 | 207 | 166 | 135 | 186 | 161 | 162 | 161 | 162 | 164 | 164 | 162 | 18 | 18 | 15 |
| 181 to 220..... | 221 | 187 | 130 | 117 | 154 | 200 | 202 | 200 | 202 | 200 | 202 | 200 | 16 | 16 | 14 |
| 221 to 260..... | 288 | 277 | 200 | 197 | 208 | 246 | 246 | 246 | 246 | 246 | 245 | 246 | 13 | 13 | 13 |
| 261 to 300..... | 156 | 158 | 106 | 102 | 122 | 293 | 292 | 293 | 292 | 292 | 291 | 291 | 13 | 12 | 12 |
| 301 to 340..... | 39 | 54 | 48 | 32 | 35 | 324 | 325 | 324 | 325 | 326 | 325 | 328 | 11 | 12 | 10 |
| 341 to 380..... | 46 | 70 | 46 | 54 | 45 | 361 | 360 | 361 | 360 | 360 | 361 | 360 | 11 | 12 | 10 |
| 381 to 420..... | 60 | 79 | 56 | 52 | 45 | 400 | 400 | 400 | 400 | 400 | 401 | 402 | 10 | 10 | 10 |
| 421 to 460..... | 21 | 39 | 19 | 26 | 20 | 448 | 446 | 448 | 446 | 447 | 443 | 447 | 10 | 11 | 9 |
| 461 to 500..... | 33 | 65 | 41 | 47 | 30 | 493 | 496 | 493 | 496 | 493 | 496 | 497 | 8 | 9 | 9 |
| 501 and over..... | 6 | 31 | 21 | 23 | 13 | 637 | 600 | 637 | 600 | 582 | 609 | 647 | 7 | 8 | 8 |

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

¹ The average yield of lint cotton in the United States has been as follows: 1924, 157.4 pounds; 1925, 167.2 pounds; 1926, 182.6 pounds; 1927, 154.5 pounds; 1928, 152.9 pounds.² The average cost per pound for the yield groups which closely approximated the average yields for the United States are as follows: 1924, 18 cents; 1925, 18 cents; 1926, 15.5 cents; 1927, 17 cents; 1928, 17 cents. At least a part of the yearly variations in costs in some of the upper and lower yield groups may be due to the small number of reports, and to the relative number of reports received each year from various sections of the Cotton Belt.

TABLE 522.—*Cost of producing wheat, corn, and oats, 1923*
Averages by geographical divisions¹

| Crop and geographical division | Reports | Acreage per crop per farm | Yield per acre | Gross cost per acre | | | | | | | | Net cost | | | | |
|--------------------------------|---------|---------------------------|----------------|---------------------|-------------|-----------|---------|-----------------------|-------------------------|---------|-----------|-----------------|---------|----------------------------------|----------|------------|
| | | | | Prepare and plant | Culti- vate | Har- vest | Market | Miscel- laneous labor | Ferti- lizer and manure | Seed | Land rent | Miscel- laneous | Total | Credit per acre for by- products | Per acre | Per bushel |
| | Number | Acres | Bushels | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| WHEAT | | | | | | | | | | | | | | | | |
| North Atlantic..... | 196 | 14 | 18 | 6.26 | 4.22 | 7.92 | 2.69 | .10 | 11.22 | .76 | 6.64 | 3.37 | 44.29 | 5.41 | 38.88 | .88 |
| South Atlantic..... | 481 | 22 | 30 | 4.96 | 3.96 | 4.07 | 2.11 | .11 | 5.32 | .44 | 5.81 | 2.44 | 28.07 | 3.00 | 26.22 | .97 |
| East North Central..... | 811 | 36 | 41 | 4.64 | 3.05 | 4.62 | 2.02 | .08 | 4.25 | .53 | 6.41 | 2.47 | 28.07 | 2.32 | 26.75 | .63 |
| West North Central..... | 1,045 | 65 | 33 | 3.25 | 2.38 | 2.98 | 1.59 | .05 | 1.54 | .44 | 6.19 | 1.77 | 19.19 | .84 | 18.35 | .56 |
| South Central..... | 1,145 | 28 | 22 | 3.82 | 3.57 | 1.93 | 1.86 | .06 | 2.12 | .39 | 6.49 | 1.97 | 21.21 | .92 | 20.29 | .92 |
| West Central..... | 1,102 | 41 | 23 | 3.46 | 2.10 | 2.53 | 2.04 | 1.38 | 1.14 | .43 | 5.05 | 2.01 | 20.14 | 1.39 | 18.75 | .82 |
| Western..... | 3,790 | 39 | 31 | 4.17 | 3.18 | 3.42 | 1.89 | .10 | 3.29 | .46 | 5.70 | 2.16 | 24.37 | 1.72 | 22.65 | .73 |
| United States..... | 3,790 | 39 | 31 | 4.17 | 3.18 | 3.42 | 1.89 | .10 | 3.29 | .46 | 5.70 | 2.16 | 24.37 | 1.72 | 22.65 | .73 |
| OATS | | | | | | | | | | | | | | | | |
| North Atlantic..... | 284 | 12 | 38 | 6.25 | 4.17 | 7.92 | 2.69 | .10 | 11.22 | .76 | 6.64 | 3.37 | 44.29 | 5.41 | 38.88 | .88 |
| South Atlantic..... | 201 | 11 | 20 | 4.14 | 3.96 | 4.07 | 2.11 | .11 | 5.32 | .44 | 5.81 | 2.44 | 28.07 | 3.00 | 26.22 | .97 |
| East North Central..... | 732 | 25 | 42 | 3.30 | 2.38 | 2.98 | 1.59 | .05 | 1.54 | .44 | 6.19 | 1.77 | 19.19 | .84 | 18.35 | .56 |
| West North Central..... | 998 | 37 | 36 | 2.61 | 2.38 | 2.98 | 1.59 | .05 | 1.54 | .44 | 6.19 | 1.77 | 19.19 | .84 | 18.35 | .56 |
| South Central..... | 246 | 28 | 28 | 2.88 | 2.10 | 2.53 | 2.04 | 1.38 | 1.14 | .43 | 5.05 | 2.01 | 20.14 | 1.39 | 18.75 | .82 |
| West Central..... | 160 | 26 | 40 | 4.17 | 3.18 | 3.42 | 1.89 | .10 | 3.29 | .46 | 5.70 | 2.16 | 24.37 | 1.72 | 22.65 | .73 |
| Western..... | 2,621 | 27 | 37 | 3.44 | 3.18 | 3.42 | 1.89 | .10 | 3.29 | .46 | 5.70 | 2.16 | 24.37 | 1.72 | 22.65 | .73 |
| United States..... | 2,621 | 27 | 37 | 3.44 | 3.18 | 3.42 | 1.89 | .10 | 3.29 | .46 | 5.70 | 2.16 | 24.37 | 1.72 | 22.65 | .73 |

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters. For figures for 1923, 1924, 1925, 1926, and 1927, see June issues of Monthly Supplement, Crops and Markets, 1924, p. 176; 1925, p. 180; 1926, p. 170; Crops and Markets, June issues, 1927; p. 202; 1928, p. 156.

¹ The States included in the geographical divisions are as follows: North Atlantic—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. South Atlantic—Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida. East North Central—Ohio, Indiana, Illinois, Michigan, and Wisconsin. West North Central—Minnesota, Iowa, Missouri, Nebraska, Kansas, Oklahoma, and Arkansas. South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas. West Central—Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon, and California.

² Threshing for wheat and oats is included under harvesting.

³ Includes miscellaneous labor, irrigating and water, and seed treatment and material.

⁴ Sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.

TABLE 523.—Cost of producing wheat, corn, and oats, 1923-1928

| Crop and geographical division ¹ | Number of reports | | | | | | Net cost per acre (dollars) | | | | | | Net cost per bushel (cents) | | | | | | Yield per acre (bushels) | | | | | |
|--|-------------------|-------|-------|-------|-------|-------|-----------------------------|-------|-------|-------|-------|-------|-----------------------------|------|------|------|------|------|--------------------------|------|------|------|------|------|
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
| WHEAT | | | | | | | | | | | | | | | | | | | | | | | | |
| North Atlantic..... | 642 | 427 | 310 | 258 | 279 | 196 | 28.43 | 28.46 | 30.43 | 29.41 | 28.48 | 27.12 | 124 | 142 | 132 | 128 | 129 | 151 | 23 | 20 | 23 | 23 | 22 | 18 |
| South Atlantic..... | 961 | 478 | 400 | 277 | 263 | 232 | 22.42 | 23.92 | 25.49 | 24.24 | 22.58 | 24.20 | 160 | 160 | 150 | 121 | 131 | 142 | 14 | 15 | 17 | 20 | 16 | 17 |
| East North Central..... | 2,028 | 1,183 | 1,084 | 969 | 762 | 535 | 22.12 | 23.05 | 23.20 | 23.37 | 22.58 | 21.57 | 111 | 115 | 129 | 102 | 113 | 154 | 20 | 18 | 23 | 20 | 14 | 14 |
| West North Central..... | 2,479 | 1,524 | 1,326 | 1,168 | 831 | 16.17 | 17.38 | 17.38 | 17.16 | 16.31 | 16.95 | 16.75 | 124 | 97 | 123 | 116 | 113 | 99 | 13 | 18 | 14 | 15 | 17 | 12 |
| South Central..... | 745 | 408 | 241 | 260 | 227 | 242 | 17.16 | 17.74 | 17.89 | 18.61 | 17.80 | 19.90 | 132 | 118 | 149 | 98 | 148 | 149 | 13 | 15 | 12 | 19 | 12 | 12 |
| Western..... | 997 | 596 | 398 | 446 | 420 | 324 | 23.95 | 24.05 | 26.20 | 23.93 | 24.43 | 24.90 | 169 | 120 | 119 | 120 | 106 | 104 | 22 | 20 | 22 | 20 | 23 | 24 |
| United States..... | 7,852 | 4,616 | 3,759 | 3,545 | 3,119 | 2,400 | 21.02 | 21.88 | 22.41 | 21.33 | 21.30 | 21.01 | 124 | 122 | 132 | 112 | 118 | 124 | 17 | 18 | 17 | 19 | 18 | 17 |
| CORN | | | | | | | | | | | | | | | | | | | | | | | | |
| North Atlantic..... | 815 | 585 | 432 | 317 | 319 | 206 | 40.73 | 41.99 | 44.23 | 42.70 | 38.91 | 38.88 | 87 | 102 | 87 | 91 | 85 | 88 | 47 | 41 | 51 | 47 | 46 | 44 |
| South Atlantic..... | 1,635 | 881 | 772 | 472 | 503 | 481 | 25.57 | 27.07 | 27.71 | 26.13 | 25.62 | 26.22 | 85 | 97 | 96 | 84 | 83 | 87 | 30 | 28 | 29 | 31 | 31 | 30 |
| East North Central..... | 2,714 | 1,690 | 1,164 | 1,394 | 1,110 | 811 | 26.77 | 25.60 | 27.35 | 26.06 | 26.00 | 25.75 | 61 | 75 | 56 | 61 | 68 | 63 | 44 | 34 | 49 | 43 | 38 | 41 |
| West North Central..... | 3,312 | 2,242 | 1,968 | 1,837 | 1,741 | 1,045 | 18.81 | 18.96 | 19.98 | 18.28 | 19.24 | 18.35 | 54 | 70 | 59 | 68 | 57 | 56 | 35 | 27 | 34 | 27 | 34 | 33 |
| South Central..... | 2,285 | 1,456 | 1,176 | 895 | 945 | 1,145 | 21.18 | 21.18 | 21.87 | 20.72 | 20.99 | 20.29 | 88 | 88 | 99 | 74 | 81 | 92 | 24 | 24 | 22 | 28 | 26 | 22 |
| Western..... | 457 | 299 | 150 | 205 | 160 | 102 | 19.02 | 18.58 | 20.77 | 19.59 | 21.80 | 18.75 | 66 | 88 | 83 | 93 | 84 | 82 | 29 | 21 | 25 | 21 | 25 | 23 |
| United States..... | 11,238 | 7,153 | 6,182 | 5,120 | 4,778 | 3,790 | 23.75 | 23.77 | 24.97 | 23.10 | 23.21 | 22.65 | 68 | 82 | 69 | 70 | 70 | 73 | 35 | 29 | 36 | 33 | 33 | 31 |
| OATS | | | | | | | | | | | | | | | | | | | | | | | | |
| North Atlantic..... | 877 | 647 | 473 | 381 | 411 | 284 | 24.80 | 25.76 | 26.00 | 26.07 | 25.03 | 25.15 | 67 | 63 | 61 | 64 | 63 | 66 | 37 | 41 | 43 | 41 | 40 | 38 |
| South Atlantic..... | 834 | 431 | 351 | 220 | 220 | 201 | 19.14 | 20.12 | 21.28 | 20.31 | 20.27 | 20.43 | 74 | 75 | 76 | 70 | 72 | 70 | 26 | 27 | 28 | 29 | 28 | 29 |
| East North Central..... | 2,227 | 1,480 | 1,477 | 1,242 | 973 | 732 | 18.21 | 18.84 | 19.07 | 18.34 | 18.77 | 18.53 | 48 | 44 | 45 | 46 | 51 | 44 | 38 | 43 | 42 | 40 | 37 | 42 |
| West North Central..... | 2,974 | 2,029 | 1,798 | 1,587 | 1,464 | 998 | 15.31 | 16.43 | 16.38 | 15.01 | 15.91 | 15.98 | 44 | 44 | 46 | 50 | 50 | 44 | 34 | 37 | 36 | 27 | 32 | 36 |
| South Central..... | 865 | 510 | 347 | 361 | 259 | 246 | 13.84 | 15.23 | 16.90 | 17.71 | 15.98 | 16.53 | 63 | 58 | 77 | 47 | 67 | 59 | 25 | 28 | 22 | 38 | 24 | 28 |
| Western..... | 704 | 422 | 229 | 244 | 244 | 160 | 22.74 | 22.62 | 24.64 | 21.56 | 22.32 | 21.68 | 55 | 65 | 65 | 65 | 55 | 54 | 41 | 35 | 38 | 33 | 41 | 40 |
| United States..... | 8,481 | 5,509 | 4,675 | 4,045 | 3,590 | 2,621 | 18.08 | 18.93 | 19.01 | 17.99 | 18.47 | 18.40 | 52 | 50 | 51 | 53 | 54 | 50 | 35 | 38 | 37 | 34 | 34 | 37 |

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

¹ The States included in the geographical divisions are as follows: North Atlantic—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. South Atlantic—Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida. East North Central—Ohio, Indiana, Illinois, Michigan, and Wisconsin. West North Central—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas. South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas. Western—Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon, and California.

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TABLE 524.—*Indexes of the volume of net agricultural production* ¹

[1919-1927 = 100]

| Year | Grains | Fruits and vegetables | Truck crops | Meat animals | Dairy products | Poultry products | Cotton and cottonseed | Total |
|-----------|--------|-----------------------|-------------|--------------|----------------|------------------|-----------------------|-------|
| 1919..... | 101 | 82 | 71 | 96 | 81 | 85 | 91 | 91 |
| 1920..... | 116 | 102 | 86 | 92 | 80 | 84 | 105 | 97 |
| 1921..... | 100 | 76 | 74 | 91 | 91 | 95 | 64 | 87 |
| 1922..... | 100 | 109 | 101 | 97 | 95 | 98 | 77 | 96 |
| 1923..... | 97 | 108 | 99 | 107 | 103 | 107 | 80 | 101 |
| 1924..... | 100 | 106 | 111 | 108 | 109 | 100 | 108 | 106 |
| 1925..... | 95 | 98 | 115 | 102 | 110 | 104 | 128 | 106 |
| 1926..... | 93 | 116 | 114 | 103 | 114 | 111 | 143 | 111 |
| 1927..... | 97 | 104 | 129 | 103 | 116 | 116 | 103 | 106 |
| 1928..... | 106 | 122 | 124 | 105 | 117 | 112 | 114 | 111 |
| 1929..... | 92 | 98 | 139 | 105 | 117 | 107 | 119 | 107 |

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¹ These indexes are based on estimates of production for sale and for consumption in the farm home. Production fed to livestock or used for seed is not included. For example, instead of total production, only the amounts of corn and oats shipped out of county where grown and only a small percentage of the hay crops are included. The index of dairy products represent total milk production for all purposes. Production of meat animals is represented by total slaughter, including slaughter for farm use. Calendar-year production of livestock and livestock products are here compared with crop production of the same year. Each group index as well as the total is obtained by multiplying the yearly quantities by a 1919-1927 average farm price received by producers for each of the commodities, and the sum of these yearly values at average prices, divided by the corresponding average sum for the period 1919-1927, taken as 100. The following commodities included in the index contribute about 90 per cent of the gross income from agricultural production: Grains—wheat, corn, oats, barley, rye, buckwheat, kafir, rice; fruits and vegetables—grapes, apples, apricots, peaches, pears, cranberries, figs, grapefruit, lemons, olives, oranges, potatoes, sweetpotatoes, dry edible beans; truck crops—asparagus, snap beans, cabbage, cantaloupes, cauliflower, celery, cucumbers, lettuce, onions, peas, spinach, strawberries, tomatoes, watermelons; meat animals—cattle, calves, sheep, lambs, hogs; dairy products—milk, total production; poultry products—chickens and eggs; cotton and cottonseed; total includes also tobacco, wool, and hay.

TABLE 525.—*Current value of capital rates earned on agricultural and nonagricultural capital, and income per farm available for capital, labor, and management, 1919-1928*

| Year beginning July | Current value of all capital used in agricultural production ¹ | Current value of operator's net investment in agricultural production ² | Rates earned for capital and management on— | | Income per farm available for— | |
|---------------------|---|--|---|------------------------|---|-----------------------------------|
| | | | Total capital | Operator's net capital | Capital, labor, and management ³ | Labor and management ⁴ |
| | 1,000,000 dollars | 1,000,000 dollars | Per cent | Per cent | Dollars | Dollars |
| 1919..... | 79,325 | 46,941 | 6.3 | 5.7 | 1,246 | 918 |
| 1920..... | 73,043 | 41,076 | .5 | -4.2 | 684 | 397 |
| 1921..... | 63,734 | 34,634 | 1.2 | -2.3 | 514 | 271 |
| 1922..... | 62,489 | 34,261 | 3.2 | 1.2 | 682 | 441 |
| 1923..... | 60,304 | 32,968 | 3.5 | 1.6 | 766 | 534 |
| 1924..... | 59,683 | 32,514 | 4.5 | 3.2 | 854 | 624 |
| 1925..... | 59,650 | 32,665 | 5.2 | 4.4 | 922 | 691 |
| 1926..... | 58,254 | 31,811 | 4.3 | 2.9 | 862 | 636 |
| 1927..... | 58,346 | 32,106 | 4.7 | 3.6 | 896 | 668 |
| 1928..... | 58,645 | 32,533 | 4.7 | 3.7 | 901 | 669 |

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¹ As of Jan. 1 in the period indicated. Values include land, buildings (dwellings and other), livestock, implements, machinery, motor vehicles, and an allowance for cash working capital.

² Total capital investment less property rented from nonoperators and debts owed to nonoperators.

³ Net income available for operators' capital, labor, and management calculated on the basis of the number of farmers interpolated between 6,448,000 in 1920 and 6,372,000 in 1925.

⁴ After allowing 4½ per cent on operators' net capital investment.

TABLE 526.—*Gross value of farm production and gross income, 1919-1928*

| Year beginning July | Gross value of all farm production ¹ | Deductions for products fed, used for seed, and waste ² | Gross income from farm production | | | | | | |
|---------------------|---|--|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|----------------------------|--------------------------|
| | | | Total | Grains | Meat animals | Fruits and vegetables | Cotton and cottonseed | Dairy and poultry products | All other |
| | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> |
| 1919 | 24,025 | 8,306 | 15,719 | 3,005 | 3,348 | 1,747 | 2,271 | 3,598 | 1,752 |
| 1920 | 17,800 | 5,132 | 12,668 | 2,246 | 2,328 | 1,705 | 1,272 | 3,502 | 1,615 |
| 1921 | 12,894 | 3,680 | 9,214 | 1,206 | 1,932 | 1,379 | 760 | 2,877 | 1,000 |
| 1922 | 14,909 | 4,543 | 10,366 | 1,393 | 2,180 | 1,410 | 1,251 | 2,957 | 1,175 |
| 1923 | 16,249 | 4,961 | 11,288 | 1,393 | 2,167 | 1,526 | 1,608 | 3,315 | 1,279 |
| 1924 | 17,086 | 5,083 | 12,003 | 1,842 | 2,619 | 1,333 | 1,719 | 3,258 | 1,232 |
| 1925 | 16,995 | 4,325 | 12,670 | 1,504 | 2,848 | 1,686 | 1,749 | 3,589 | 1,204 |
| 1926 | 16,487 | 4,360 | 12,127 | 1,455 | 2,883 | 1,585 | 1,260 | 3,775 | 1,169 |
| 1927 | 17,153 | 4,849 | 12,304 | 1,605 | 2,871 | 1,500 | 1,476 | 3,630 | 1,222 |
| 1928 | 17,144 | 4,617 | 12,527 | 1,540 | 3,016 | 1,436 | 1,479 | 3,840 | 1,216 |

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¹ These gross values of all farm production are here evaluated in terms of crop year (practically July-June) production and weighted average farm prices.² These deductions, to obtain gross income, cover portions of crops and dairy products fed to livestock, used for seed in further crop production, and waste. For the industry as a whole these deductions constitute raw materials, the income from which is derived from the finished products sold or consumed in the farm home.TABLE 527.—*Distribution of gross income from agricultural production, 1919-1928*

| Year beginning July | Gross income | Value of food and fuel consumed on farms | Cash income from sales | Distribution of cash income | | | | | |
|---------------------|--------------------------|--|--------------------------|-----------------------------------|--------------------------|------------------------------------|---|-----------------------------------|---|
| | | | | Wages to hired labor ¹ | Operating costs | Taxes on operator-owned investment | Rent on property rented from nonoperators | Interest on debts to nonoperators | Balance available for living expenses, etc. |
| | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> | <i>1,000,000 dollars</i> |
| 1919 | 15,719 | 2,887 | 12,832 | 1,492 | 3,306 | 388 | 1,712 | 787 | 5,147 |
| 1920 | 12,668 | 2,045 | 10,623 | 1,732 | 3,689 | 545 | 1,399 | 897 | 1,761 |
| 1921 | 9,214 | 2,129 | 7,085 | 1,088 | 2,418 | 582 | 969 | 840 | 1,168 |
| 1922 | 10,366 | 2,168 | 8,198 | 1,061 | 2,501 | 617 | 1,014 | 809 | 2,196 |
| 1923 | 11,288 | 2,360 | 8,928 | 1,204 | 2,760 | 626 | 1,034 | 774 | 2,530 |
| 1924 | 12,003 | 2,327 | 9,676 | 1,207 | 2,865 | 635 | 1,094 | 758 | 3,117 |
| 1925 | 12,670 | 2,535 | 10,135 | 1,216 | 3,053 | 635 | 1,127 | 758 | 3,346 |
| 1926 | 12,127 | 2,590 | 9,534 | 1,238 | 2,980 | 645 | 1,042 | 750 | 2,892 |
| 1927 | 12,304 | 2,434 | 9,870 | 1,231 | 2,954 | 657 | 1,043 | 750 | 3,235 |
| 1928 | 12,527 | 2,578 | 10,001 | 1,226 | 3,144 | 664 | 1,048 | 760 | 3,107 |

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¹ Includes value of board as well as cash.

MISCELLANEOUS AGRICULTURAL STATISTICS

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TABLE 528.—Index numbers of farm prices, United States, 1910-1929

[August, 1909-July, 1914=100]

GRAINS

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|------|------|------|------|-----|------|------|------|-------|------|------|------|---------|
| 1910..... | 110 | 112 | 112 | 109 | 107 | 106 | 107 | 106 | 102 | 97 | 92 | 90 | 104 |
| 1911..... | 91 | 90 | 88 | 89 | 92 | 94 | 97 | 99 | 101 | 104 | 103 | 102 | 96 |
| 1912..... | 104 | 107 | 110 | 116 | 123 | 122 | 115 | 106 | 100 | 95 | 87 | 82 | 106 |
| 1913..... | 84 | 86 | 86 | 88 | 91 | 94 | 93 | 95 | 98 | 97 | 96 | 97 | 92 |
| 1914..... | 97 | 98 | 99 | 100 | 101 | 100 | 97 | 104 | 111 | 110 | 108 | 111 | 103 |
| 1915..... | 123 | 134 | 136 | 138 | 139 | 127 | 118 | 115 | 106 | 101 | 99 | 102 | 120 |
| 1916..... | 112 | 115 | 111 | 111 | 113 | 110 | 113 | 127 | 138 | 147 | 158 | 157 | 126 |
| 1917..... | 161 | 169 | 179 | 217 | 251 | 246 | 250 | 248 | 233 | 223 | 213 | 213 | 217 |
| 1918..... | 218 | 227 | 234 | 235 | 231 | 227 | 228 | 230 | 229 | 222 | 216 | 217 | 226 |
| 1919..... | 217 | 214 | 220 | 234 | 245 | 245 | 248 | 246 | 233 | 222 | 220 | 220 | 231 |
| 1920..... | 241 | 242 | 246 | 261 | 277 | 283 | 266 | 252 | 222 | 193 | 157 | 138 | 231 |
| 1921..... | 138 | 136 | 131 | 118 | 116 | 117 | 109 | 103 | 100 | 94 | 88 | 88 | 112 |
| 1922..... | 91 | 102 | 111 | 114 | 115 | 111 | 105 | 100 | 97 | 101 | 106 | 111 | 105 |
| 1923..... | 113 | 114 | 117 | 121 | 123 | 119 | 112 | 109 | 111 | 113 | 110 | 108 | 114 |
| 1924..... | 110 | 113 | 114 | 113 | 114 | 116 | 130 | 141 | 140 | 150 | 147 | 155 | 129 |
| 1925..... | 172 | 178 | 172 | 152 | 150 | 164 | 152 | 157 | 148 | 135 | 138 | 140 | 156 |
| 1926..... | 143 | 140 | 133 | 131 | 131 | 130 | 125 | 128 | 121 | 123 | 121 | 120 | 129 |
| 1927..... | 120 | 122 | 121 | 119 | 127 | 140 | 139 | 138 | 134 | 128 | 120 | 123 | 128 |
| 1928..... | 125 | 128 | 136 | 144 | 160 | 152 | 142 | 120 | 117 | 116 | 110 | 112 | 130 |
| 1929..... | 115 | 123 | 124 | 120 | 113 | 111 | 122 | 129 | 131 | 128 | 118 | 119 | 121 |

FRUITS AND VEGETABLES

| | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1910..... | 90 | 93 | 92 | 92 | 96 | 93 | 90 | 94 | 94 | 88 | 84 | 87 | 91 |
| 1911..... | 92 | 94 | 97 | 106 | 108 | 121 | 129 | 125 | 109 | 94 | 93 | 102 | 106 |
| 1912..... | 109 | 118 | 130 | 144 | 150 | 135 | 116 | 104 | 86 | 74 | 73 | 78 | 110 |
| 1913..... | 79 | 81 | 81 | 83 | 92 | 99 | 103 | 102 | 96 | 97 | 96 | 97 | 92 |
| 1914..... | 101 | 106 | 110 | 115 | 117 | 119 | 113 | 102 | 92 | 79 | 71 | 72 | 100 |
| 1915..... | 75 | 78 | 77 | 82 | 90 | 91 | 89 | 85 | 76 | 79 | 84 | 89 | 83 |
| 1916..... | 99 | 108 | 112 | 114 | 117 | 124 | 125 | 123 | 121 | 129 | 147 | 156 | 123 |
| 1917..... | 167 | 208 | 241 | 265 | 283 | 270 | 219 | 165 | 146 | 150 | 155 | 156 | 202 |
| 1918..... | 158 | 162 | 157 | 156 | 160 | 160 | 172 | 177 | 166 | 160 | 158 | 155 | 162 |
| 1919..... | 154 | 156 | 167 | 179 | 197 | 205 | 216 | 219 | 194 | 186 | 187 | 206 | 189 |
| 1920..... | 226 | 252 | 279 | 323 | 373 | 366 | 314 | 239 | 180 | 150 | 141 | 144 | 249 |
| 1921..... | 136 | 127 | 125 | 124 | 132 | 140 | 156 | 178 | 171 | 162 | 162 | 165 | 148 |
| 1922..... | 158 | 173 | 181 | 190 | 206 | 197 | 174 | 129 | 109 | 101 | 101 | 104 | 152 |
| 1923..... | 117 | 122 | 130 | 146 | 157 | 161 | 165 | 151 | 131 | 123 | 114 | 114 | 136 |
| 1924..... | 118 | 123 | 123 | 128 | 132 | 146 | 142 | 138 | 113 | 109 | 108 | 110 | 124 |
| 1925..... | 122 | 131 | 138 | 146 | 162 | 184 | 178 | 178 | 142 | 152 | 194 | 194 | 160 |
| 1926..... | 214 | 218 | 220 | 253 | 240 | 216 | 195 | 166 | 136 | 136 | 142 | 137 | 189 |
| 1927..... | 140 | 142 | 140 | 147 | 158 | 201 | 195 | 172 | 145 | 138 | 136 | 141 | 155 |
| 1928..... | 144 | 153 | 174 | 179 | 181 | 168 | 156 | 137 | 127 | 114 | 109 | 108 | 146 |
| 1929..... | 109 | 111 | 112 | 110 | 119 | 120 | 136 | 160 | 160 | 168 | 159 | 163 | 136 |

MEAT ANIMALS

| | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1910..... | 99 | 100 | 109 | 115 | 110 | 109 | 103 | 98 | 102 | 101 | 96 | 93 | 103 |
| 1911..... | 96 | 93 | 92 | 88 | 84 | 82 | 83 | 88 | 88 | 84 | 83 | 82 | 87 |
| 1912..... | 83 | 85 | 87 | 96 | 98 | 96 | 95 | 100 | 103 | 104 | 99 | 99 | 95 |
| 1913..... | 99 | 103 | 109 | 113 | 109 | 110 | 111 | 110 | 109 | 110 | 108 | 107 | 108 |
| 1914..... | 109 | 112 | 114 | 114 | 113 | 112 | 114 | 118 | 117 | 111 | 106 | 104 | 112 |
| 1915..... | 103 | 101 | 101 | 103 | 106 | 107 | 106 | 105 | 106 | 108 | 101 | 98 | 104 |
| 1916..... | 101 | 108 | 116 | 121 | 123 | 124 | 124 | 123 | 127 | 122 | 123 | 125 | 120 |
| 1917..... | 131 | 144 | 162 | 177 | 179 | 177 | 173 | 178 | 190 | 194 | 186 | 190 | 173 |
| 1918..... | 187 | 188 | 194 | 204 | 210 | 207 | 205 | 211 | 214 | 204 | 198 | 199 | 202 |
| 1919..... | 201 | 204 | 211 | 224 | 227 | 221 | 228 | 227 | 197 | 185 | 177 | 173 | 206 |
| 1920..... | 181 | 184 | 184 | 186 | 181 | 182 | 181 | 177 | 177 | 169 | 150 | 124 | 173 |
| 1921..... | 123 | 119 | 125 | 114 | 111 | 105 | 109 | 112 | 101 | 98 | 92 | 91 | 108 |
| 1922..... | 95 | 108 | 118 | 117 | 119 | 121 | 120 | 114 | 112 | 113 | 108 | 107 | 113 |
| 1923..... | 110 | 110 | 110 | 110 | 108 | 103 | 105 | 104 | 112 | 106 | 100 | 98 | 106 |
| 1924..... | 101 | 102 | 104 | 106 | 107 | 105 | 103 | 116 | 115 | 121 | 115 | 113 | 109 |
| 1925..... | 123 | 126 | 145 | 146 | 139 | 139 | 148 | 149 | 143 | 141 | 136 | 136 | 139 |
| 1926..... | 140 | 146 | 147 | 146 | 148 | 154 | 152 | 144 | 148 | 148 | 142 | 140 | 146 |
| 1927..... | 140 | 143 | 144 | 143 | 137 | 129 | 131 | 136 | 142 | 145 | 141 | 138 | 139 |
| 1928..... | 138 | 139 | 139 | 142 | 151 | 150 | 157 | 162 | 174 | 160 | 150 | 143 | 150 |
| 1929..... | 146 | 150 | 160 | 164 | 164 | 163 | 167 | 165 | 156 | 151 | 144 | 143 | 156 |

1 Kafir omitted.

2 Onions and cabbage omitted.

TABLE 528.—Index numbers of farm prices, United States, 1910-1929—Continued

DAIRY PRODUCTS

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|------|------|------|------|-----|------|------|------|-------|------|------|------|---------|
| 1910..... | 106 | 103 | 98 | 101 | 97 | 96 | 95 | 97 | 100 | 102 | 103 | 105 | 100 |
| 1911..... | 104 | 99 | 96 | 94 | 92 | 90 | 92 | 95 | 97 | 97 | 101 | 101 | 97 |
| 1912..... | 107 | 108 | 106 | 103 | 102 | 99 | 99 | 100 | 102 | 105 | 103 | 103 | 103 |
| 1913..... | 102 | 100 | 100 | 99 | 98 | 96 | 96 | 102 | 106 | 100 | 104 | 104 | 100 |
| 1914..... | 105 | 102 | 100 | 98 | 96 | 95 | 96 | 99 | 101 | 101 | 103 | 102 | 100 |
| 1915..... | 102 | 101 | 98 | 97 | 97 | 94 | 93 | 95 | 96 | 98 | 100 | 102 | 98 |
| 1916..... | 102 | 99 | 100 | 99 | 99 | 97 | 96 | 100 | 101 | 106 | 112 | 116 | 102 |
| 1917..... | 115 | 117 | 116 | 119 | 123 | 120 | 119 | 123 | 129 | 138 | 142 | 146 | 125 |
| 1918..... | 149 | 150 | 148 | 144 | 142 | 142 | 141 | 146 | 152 | 163 | 169 | 172 | 152 |
| 1919..... | 173 | 165 | 164 | 166 | 166 | 166 | 167 | 170 | 175 | 181 | 190 | 197 | 173 |
| 1920..... | 196 | 194 | 189 | 192 | 187 | 182 | 181 | 185 | 186 | 190 | 189 | 182 | 188 |
| 1921..... | 172 | 165 | 160 | 154 | 141 | 132 | 133 | 138 | 140 | 146 | 148 | 147 | 148 |
| 1922..... | 140 | 134 | 133 | 131 | 126 | 128 | 127 | 129 | 133 | 136 | 140 | 147 | 134 |
| 1923..... | 151 | 151 | 148 | 147 | 142 | 112 | 139 | 142 | 145 | 153 | 157 | 155 | 148 |
| 1924..... | 152 | 150 | 146 | 134 | 128 | 126 | 123 | 120 | 126 | 130 | 132 | 137 | 134 |
| 1925..... | 134 | 131 | 137 | 132 | 132 | 130 | 131 | 135 | 137 | 146 | 146 | 146 | 137 |
| 1926..... | 147 | 143 | 141 | 133 | 130 | 128 | 129 | 128 | 133 | 134 | 141 | 144 | 136 |
| 1927..... | 144 | 143 | 139 | 140 | 136 | 132 | 130 | 129 | 135 | 139 | 141 | 145 | 138 |
| 1928..... | 145 | 145 | 142 | 139 | 136 | 134 | 134 | 135 | 141 | 143 | 144 | 146 | 140 |
| 1929..... | 145 | 144 | 144 | 142 | 139 | 135 | 135 | 137 | 139 | 141 | 142 | 140 | 140 |

POULTRY PRODUCTS

| | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1910..... | 130 | 116 | 98 | 91 | 90 | 89 | 88 | 90 | 98 | 109 | 120 | 129 | 104 |
| 1911..... | 116 | 90 | 77 | 74 | 74 | 73 | 75 | 81 | 89 | 100 | 115 | 125 | 91 |
| 1912..... | 127 | 118 | 97 | 84 | 82 | 81 | 83 | 88 | 97 | 109 | 123 | 124 | 101 |
| 1913..... | 111 | 98 | 87 | 81 | 82 | 84 | 85 | 90 | 101 | 116 | 133 | 138 | 101 |
| 1914..... | 130 | 119 | 99 | 86 | 85 | 87 | 89 | 95 | 105 | 112 | 123 | 133 | 105 |
| 1915..... | 133 | 114 | 91 | 84 | 84 | 84 | 84 | 88 | 97 | 111 | 126 | 134 | 103 |
| 1916..... | 127 | 110 | 95 | 90 | 93 | 96 | 99 | 106 | 120 | 137 | 156 | 166 | 116 |
| 1917..... | 162 | 156 | 139 | 134 | 145 | 141 | 138 | 147 | 162 | 174 | 185 | 198 | 157 |
| 1918..... | 210 | 201 | 168 | 150 | 148 | 149 | 160 | 172 | 185 | 205 | 220 | 247 | 185 |
| 1919..... | 234 | 190 | 165 | 175 | 185 | 185 | 186 | 195 | 203 | 225 | 255 | 275 | 206 |
| 1920..... | 267 | 236 | 205 | 189 | 186 | 185 | 191 | 204 | 222 | 243 | 267 | 272 | 222 |
| 1921..... | 243 | 185 | 131 | 114 | 111 | 114 | 128 | 143 | 156 | 180 | 210 | 211 | 161 |
| 1922..... | 176 | 140 | 118 | 110 | 114 | 113 | 111 | 114 | 132 | 159 | 187 | 198 | 139 |
| 1923..... | 175 | 151 | 130 | 117 | 117 | 114 | 116 | 126 | 144 | 165 | 191 | 198 | 145 |
| 1924..... | 162 | 157 | 109 | 105 | 109 | 115 | 121 | 132 | 153 | 176 | 203 | 217 | 147 |
| 1925..... | 213 | 166 | 124 | 127 | 131 | 135 | 141 | 148 | 152 | 175 | 208 | 213 | 161 |
| 1926..... | 172 | 145 | 128 | 133 | 135 | 138 | 137 | 137 | 155 | 173 | 202 | 212 | 156 |
| 1927..... | 173 | 145 | 115 | 114 | 112 | 102 | 112 | 122 | 143 | 167 | 189 | 195 | 141 |
| 1928..... | 177 | 144 | 122 | 121 | 128 | 127 | 134 | 140 | 156 | 168 | 185 | 197 | 150 |
| 1929..... | 161 | 158 | 144 | 127 | 134 | 140 | 143 | 151 | 165 | 181 | 200 | 204 | 159 |

COTTON AND COTTONSEED

| | | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1910..... | 116 | 113 | 113 | 113 | 114 | 113 | 113 | 115 | 112 | 111 | 113 | 115 | 113 |
| 1911..... | 117 | 114 | 113 | 114 | 116 | 116 | 110 | 100 | 88 | 77 | 72 | 70 | 101 |
| 1912..... | 71 | 76 | 81 | 85 | 89 | 89 | 93 | 92 | 89 | 88 | 91 | 97 | 87 |
| 1913..... | 97 | 96 | 95 | 95 | 94 | 94 | 94 | 93 | 101 | 106 | 102 | 98 | 97 |
| 1914..... | 96 | 99 | 99 | 98 | 100 | 101 | 100 | 86 | 66 | 58 | 54 | 57 | 85 |
| 1915..... | 60 | 65 | 67 | 73 | 74 | 72 | 70 | 70 | 81 | 99 | 99 | 100 | 78 |
| 1916..... | 100 | 100 | 99 | 102 | 104 | 107 | 109 | 115 | 128 | 144 | 163 | 160 | 119 |
| 1917..... | 148 | 144 | 149 | 160 | 169 | 189 | 204 | 199 | 197 | 214 | 232 | 237 | 187 |
| 1918..... | 244 | 249 | 257 | 251 | 235 | 234 | 235 | 246 | 264 | 253 | 236 | 235 | 245 |
| 1919..... | 225 | 208 | 206 | 213 | 232 | 249 | 260 | 259 | 252 | 277 | 295 | 292 | 247 |
| 1920..... | 293 | 295 | 298 | 304 | 303 | 301 | 297 | 266 | 218 | 175 | 132 | 101 | 248 |
| 1921..... | 93 | 89 | 80 | 76 | 78 | 78 | 79 | 91 | 130 | 150 | 137 | 131 | 101 |
| 1922..... | 129 | 128 | 131 | 135 | 144 | 160 | 166 | 166 | 160 | 168 | 186 | 195 | 156 |
| 1923..... | 203 | 215 | 224 | 222 | 211 | 207 | 199 | 190 | 204 | 221 | 238 | 253 | 210 |
| 1924..... | 255 | 247 | 219 | 226 | 222 | 219 | 215 | 219 | 175 | 182 | 179 | 176 | 211 |
| 1925..... | 182 | 183 | 195 | 189 | 184 | 183 | 186 | 186 | 178 | 171 | 144 | 139 | 177 |
| 1926..... | 138 | 142 | 133 | 135 | 130 | 132 | 126 | 130 | 134 | 94 | 88 | 81 | 122 |
| 1927..... | 85 | 94 | 102 | 101 | 113 | 119 | 125 | 136 | 179 | 169 | 162 | 153 | 126 |
| 1928..... | 152 | 141 | 147 | 154 | 166 | 162 | 170 | 153 | 142 | 147 | 146 | 148 | 152 |
| 1929..... | 148 | 149 | 155 | 152 | 148 | 146 | 145 | 146 | 146 | 141 | 132 | 130 | 145 |

TABLE 528.—Index numbers of farm prices, United States, 1910-1929—Continued

ALL GROUPS

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-------------------------|------|------|------|------|-----|------|------|------|-------|------|------|------|---------|
| 1910..... | 106 | 105 | 107 | 108 | 105 | 104 | 102 | 102 | 102 | 101 | 99 | 99 | 103 |
| 1911..... | 100 | 97 | 95 | 94 | 94 | 95 | 95 | 96 | 95 | 92 | 92 | 92 | 95 |
| 1912..... | 94 | 97 | 99 | 104 | 107 | 104 | 101 | 100 | 98 | 97 | 95 | 95 | 99 |
| 1913..... | 95 | 96 | 97 | 98 | 98 | 99 | 99 | 101 | 103 | 104 | 104 | 103 | 100 |
| 1914..... | 104 | 105 | 104 | 104 | 104 | 104 | 103 | 104 | 102 | 98 | 96 | 97 | 102 |
| 1915..... | 100 | 101 | 100 | 102 | 104 | 101 | 99 | 97 | 97 | 101 | 99 | 100 | 100 |
| 1916..... | 104 | 106 | 108 | 110 | 111 | 112 | 113 | 117 | 123 | 128 | 137 | 139 | 117 |
| 1917..... | 140 | 148 | 159 | 176 | 188 | 188 | 185 | 183 | 184 | 187 | 187 | 191 | 176 |
| 1918..... | 194 | 197 | 199 | 200 | 198 | 196 | 197 | 203 | 207 | 204 | 200 | 201 | 200 |
| 1919..... | 200 | 194 | 197 | 207 | 215 | 216 | 222 | 222 | 208 | 206 | 209 | 212 | 209 |
| 1920..... | 219 | 221 | 222 | 230 | 235 | 234 | 224 | 209 | 194 | 178 | 158 | 140 | 205 |
| 1921..... | 135 | 128 | 123 | 115 | 112 | 110 | 111 | 116 | 118 | 120 | 116 | 115 | 116 |
| 1922..... | 114 | 118 | 123 | 123 | 127 | 128 | 126 | 120 | 119 | 123 | 126 | 131 | 124 |
| 1923..... | 134 | 136 | 136 | 137 | 135 | 133 | 130 | 128 | 132 | 134 | 136 | 137 | 135 |
| 1924..... | 137 | 136 | 131 | 130 | 129 | 130 | 132 | 139 | 132 | 138 | 137 | 139 | 134 |
| 1925..... | 146 | 146 | 151 | 147 | 146 | 148 | 149 | 152 | 144 | 143 | 144 | 143 | 147 |
| 1926 ^a | 143 | 143 | 140 | 140 | 139 | 139 | 136 | 133 | 134 | 130 | 130 | 127 | 136 |
| 1927 ^a | 126 | 127 | 126 | 125 | 126 | 130 | 130 | 132 | 140 | 139 | 137 | 137 | 131 |
| 1928 ^a | 137 | 135 | 137 | 140 | 148 | 145 | 145 | 139 | 141 | 137 | 134 | 134 | 139 |
| 1929 ^a | 133 | 136 | 140 | 138 | 136 | 135 | 140 | 143 | 141 | 140 | 136 | 135 | 138 |

Bureau of Agricultural Economics. Prices of farm production received by producers collected monthly from a list of about 12,000 special price reporters. This list is made up almost entirely of country-town dealers, elevator managers, buyers, and merchants.

The commodities by groups are as follows: (Grains—wheat, corn, oats, barley, rye, kafir; fruits and vegetables—apples, oranges, grapefruit, potatoes, sweet potatoes, beans, onions, cabbage; meat animals—beef cattle, calves, hogs, sheep, lambs; dairy products—butter (represents butter, butterfat, and cream), milk; poultry products—chickens, eggs; cotton and cottonseed; all groups includes also horses (represents horses and mules), hay, flax, tobacco, and wool.

^a Kafir, onions, and cabbage omitted.

TABLE 529.—Index numbers of farm prices, 1910-1928: By groups, crop-year averages

[August, 1909-July, 1914=100]

| Year beginning July | Grains | Fruits and vegetables | Meat animals | Dairy products | Poultry products | Cotton and cottonseed | All groups |
|---------------------|--------|-----------------------|--------------|----------------|------------------|-----------------------|------------|
| 1910..... | 95 | 96 | 94 | 98 | 95 | 114 | 98 |
| 1911..... | 107 | 120 | 88 | 101 | 98 | 84 | 97 |
| 1912..... | 93 | 87 | 104 | 101 | 97 | 93 | 97 |
| 1913..... | 98 | 105 | 111 | 101 | 106 | 99 | 103 |
| 1914..... | 120 | 85 | 108 | 99 | 104 | 69 | 101 |
| 1915..... | 109 | 98 | 110 | 98 | 104 | 94 | 104 |
| 1916..... | 172 | 186 | 143 | 112 | 138 | 148 | 146 |
| 1917..... | 229 | 162 | 192 | 139 | 169 | 229 | 192 |
| 1918..... | 226 | 170 | 210 | 162 | 364 | 234 | 203 |
| 1919..... | 246 | 252 | 190 | 185 | 217 | 286 | 220 |
| 1920..... | 164 | 163 | 140 | 170 | 191 | 140 | 152 |
| 1921..... | 102 | 175 | 107 | 137 | 150 | 129 | 119 |
| 1922..... | 111 | 129 | 110 | 141 | 142 | 194 | 130 |
| 1923..... | 112 | 131 | 104 | 144 | 141 | 224 | 132 |
| 1924..... | 155 | 134 | 125 | 131 | 158 | 188 | 142 |
| 1925..... | 140 | 200 | 144 | 139 | 157 | 151 | 143 |
| 1926..... | 124 | 153 | 142 | 137 | 148 | 106 | 129 |
| 1927..... | 136 | 160 | 141 | 158 | 146 | 154 | 138 |
| 1928..... | 119 | 119 | 158 | 141 | 154 | 150 | 137 |

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See footnotes, Table 527.

GENERAL NOTE.—Tables similar to Tables 495-501, 1927 Yearbook, index numbers of wholesale prices, are omitted.

TABLE 530.—*Index numbers of general trend of prices and wages*

[1910-1914=100]

| Year and month | Whole-sale prices of all commodities ¹ | Industrial wages ² | Prices paid by farmers for commodities used in— | | | Farm wages | Taxes ³ |
|----------------|---|-------------------------------|---|-------------|-------------------|------------|--------------------|
| | | | Living | Pro-duction | Living production | | |
| 1910..... | 103 | ----- | 98 | 98 | 98 | 97 | ----- |
| 1911..... | 95 | ----- | 100 | 103 | 101 | 97 | ----- |
| 1912..... | 101 | ----- | 101 | 98 | 100 | 101 | ----- |
| 1913..... | 102 | ----- | 100 | 102 | 100 | 104 | ----- |
| 1914..... | 100 | ----- | 102 | 99 | 101 | 101 | 100 |
| 1915..... | 103 | 101 | 107 | 103 | 106 | 102 | 102 |
| 1916..... | 129 | 114 | 125 | 121 | 123 | 112 | 104 |
| 1917..... | 180 | 129 | 148 | 152 | 150 | 140 | 106 |
| 1918..... | 198 | 160 | 180 | 176 | 178 | 176 | 118 |
| 1919..... | 210 | 185 | 214 | 192 | 205 | 206 | 130 |
| 1920..... | 230 | 222 | 227 | 175 | 206 | 239 | 155 |
| 1921..... | 150 | 203 | 165 | 142 | 156 | 150 | 217 |
| 1922..... | 152 | 197 | 160 | 140 | 152 | 146 | 232 |
| 1923..... | 156 | 214 | 161 | 142 | 153 | 166 | 246 |
| 1924..... | 152 | 218 | 162 | 143 | 154 | 166 | 249 |
| 1925..... | 162 | 223 | 165 | 149 | 159 | 168 | 250 |
| 1926..... | 154 | 229 | 164 | 144 | 156 | 171 | 253 |
| 1927..... | 149 | 231 | 161 | 144 | 154 | 170 | 258 |
| 1928..... | 153 | 232 | 162 | 146 | 156 | 169 | 263 |
| 1929..... | 151 | 236 | ----- | ----- | ----- | 170 | ----- |
| 1929 | | | | | | | |
| January..... | 152 | 234 | ----- | ----- | ----- | 162 | ----- |
| February..... | 151 | 236 | ----- | ----- | ----- | ----- | ----- |
| March..... | 153 | 239 | 161 | 148 | 156 | ----- | ----- |
| April..... | 152 | 237 | ----- | ----- | ----- | 167 | ----- |
| May..... | 150 | 236 | ----- | ----- | ----- | ----- | ----- |
| June..... | 151 | 236 | 160 | 146 | 155 | ----- | ----- |
| July..... | 154 | 235 | ----- | ----- | ----- | 173 | ----- |
| August..... | 153 | 237 | ----- | ----- | ----- | ----- | ----- |
| September..... | 153 | 240 | 161 | 146 | 155 | ----- | ----- |
| October..... | 151 | 237 | ----- | ----- | ----- | 174 | ----- |
| November..... | 148 | 233 | ----- | ----- | ----- | ----- | ----- |
| December..... | 148 | 234 | ----- | ----- | ----- | ----- | ----- |

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¹ Bureau of Labor Statistics. Index for 1929 obtained by multiplying new series by 156.6.² Average weekly earnings, New York State factories. June, 1914=100.³ Index of estimate of total taxes paid on all farm property. 1914=100.

TABLE 531.—Index numbers of prices paid by farmers, 1910-1929

[Base 1910-1914=100]

| Year or date | Commodities used in production | | | | | | Wages paid to hired labor | Commodities bought for use in production plus wages paid to hired labor | Commodities bought for family maintenance ² | Taxes on farm property ³ |
|--------------|--------------------------------|-----------|------------|---|------------------------|-------------------|---------------------------|---|--|-------------------------------------|
| | Feed | Machinery | Fertilizer | Building materials for other than house | Equipment and supplies | Seed ¹ | | | | |
| 1910 | 92 | 101 | 97 | 100 | 101 | ----- | 98 | 97 | 98 | ----- |
| 1911 | 108 | 103 | 97 | 102 | 100 | ----- | 103 | 97 | 101 | 100 |
| 1912 | 90 | 100 | 102 | 103 | 100 | 105 | 98 | 101 | 99 | 101 |
| 1913 | 108 | 98 | 104 | 101 | 100 | 94 | 102 | 104 | 102 | 99 |
| 1914 | 103 | 98 | 101 | 93 | 99 | 101 | 99 | 101 | 100 | 102 |
| 1915 | 98 | 101 | 113 | 102 | 106 | 117 | 103 | 102 | 103 | 107 |
| 1916 | 129 | 111 | 122 | 118 | 129 | 112 | 121 | 112 | 119 | 125 |
| 1917 | 186 | 132 | 139 | 137 | 156 | 141 | 152 | 140 | 149 | 148 |
| 1918 | 196 | 160 | 173 | 161 | 180 | 188 | 176 | 176 | 176 | 180 |
| 1919 | 208 | 178 | 185 | 189 | 179 | 264 | 192 | 206 | 196 | 214 |
| 1920 | 133 | 188 | 189 | 205 | 188 | 149 | 175 | 239 | 189 | 227 |
| 1921 | 91 | 175 | 159 | 156 | 151 | 125 | 142 | 150 | 144 | 165 |
| 1922 | 118 | 156 | 131 | 159 | 139 | 133 | 140 | 146 | 142 | 160 |
| 1923 | 128 | 151 | 128 | 160 | 138 | 142 | 142 | 166 | 147 | 161 |
| 1924 | 135 | 155 | 122 | 159 | 131 | 148 | 143 | 166 | 148 | 162 |
| 1925 | 145 | 158 | 131 | 163 | 136 | 170 | 149 | 168 | 154 | 165 |
| 1926 | 120 | 156 | 129 | 163 | 142 | 190 | 144 | 171 | 150 | 164 |
| 1927 | 124 | 157 | 123 | 164 | 134 | 192 | 144 | 170 | 150 | 161 |
| 1928 | 133 | 158 | 133 | 161 | 131 | 170 | 146 | 169 | 151 | 162 |
| 1929: | | | | | | | | | | |
| Jan. 15 | 121 | 149 | 123 | 158 | 137 | 138 | 138 | 137 | 138 | 158 |
| Apr. 15 | 129 | 150 | 127 | 160 | 143 | 143 | 142 | 148 | 144 | 163 |
| July 15 | 132 | 153 | 130 | 163 | 141 | 139 | 144 | 169 | 150 | 163 |
| Oct. 15 | 131 | 153 | 130 | 161 | 130 | 146 | 142 | 174 | 149 | 162 |
| 1924: | | | | | | | | | | |
| Jan. 15 | 127 | 154 | 127 | 160 | 130 | 142 | 141 | 159 | 145 | 163 |
| Apr. 15 | 128 | 154 | 117 | 160 | 137 | 155 | 142 | 163 | 147 | 162 |
| July 15 | 138 | 155 | 119 | 158 | 132 | 148 | 143 | 168 | 149 | 159 |
| Oct. 15 | 148 | 155 | 125 | 159 | 125 | 148 | 145 | 171 | 151 | 161 |
| 1925: | | | | | | | | | | |
| Jan. 15 | 154 | 157 | 127 | 161 | 126 | 163 | 149 | 156 | 150 | 164 |
| Apr. 15 | 146 | 158 | 130 | 161 | 138 | 178 | 150 | 163 | 153 | 166 |
| July 15 | 147 | 157 | 132 | 165 | 141 | 178 | 152 | 169 | 156 | 166 |
| Oct. 15 | 134 | 157 | 134 | 164 | 140 | 159 | 147 | 173 | 153 | 165 |
| 1926: | | | | | | | | | | |
| Jan. 15 | 126 | 155 | 130 | 162 | 140 | 183 | 145 | 159 | 148 | 165 |
| Apr. 15 | 119 | 156 | 128 | 163 | 143 | 191 | 144 | 166 | 149 | 164 |
| June 15 | 119 | 156 | 132 | 163 | 146 | 196 | 145 | 174 | 152 | 165 |
| Sept. 15 | 122 | 156 | 127 | 162 | 144 | 188 | 145 | 176 | 152 | 163 |
| Dec. 15 | 115 | 156 | 128 | 162 | 140 | 192 | 143 | 162 | 147 | 163 |
| 1927: | | | | | | | | | | |
| Mar. 15 | 117 | 157 | 121 | 164 | 137 | 202 | 143 | 166 | 148 | 161 |
| June 15 | 128 | 157 | 121 | 164 | 133 | 202 | 145 | 172 | 151 | 161 |
| Sept. 15 | 130 | 157 | 125 | 164 | 133 | 181 | 145 | 175 | 152 | 161 |
| Dec. 15 | 123 | 157 | 125 | 161 | 132 | 181 | 142 | 161 | 146 | 161 |
| 1928: | | | | | | | | | | |
| Mar. 15 | 130 | 156 | 133 | 160 | 132 | 181 | 145 | 166 | 149 | 162 |
| June 15 | 143 | 156 | 133 | 161 | 130 | 181 | 148 | 170 | 153 | 163 |
| Sept. 15 | 131 | 156 | 132 | 162 | 131 | 177 | 144 | 175 | 151 | 163 |
| Dec. 15 | 129 | 162 | 132 | 162 | 131 | 177 | 146 | 162 | 150 | 161 |
| 1929: | | | | | | | | | | |
| Mar. 15 | 136 | 162 | 134 | 163 | 129 | 201 | 148 | 167 | 153 | 161 |
| June 15 | 128 | 162 | 134 | 163 | 129 | 201 | 146 | 173 | 152 | 160 |
| Sept. 15 | 133 | 162 | 131 | 162 | 129 | 179 | 146 | 174 | 153 | 161 |
| Dec. 15 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

Bureau of Agricultural Economics. Compiled from prices reported to the Department of Agriculture by retail dealers throughout the United States. The index numbers include only commodities bought by farmers; the commodities being weighted according to purchases reported by actual farmers in farm management and rural-life studies from 1920 to 1925.

¹ 1912-1914=100.

² Includes food, clothing, household operating expenses, furniture and furnishings, and building material for house.

³ 1914=100.

GENERAL NOTE.—Tables similar to Tables 504-507, 1927 Yearbook, pertaining to farm business and farm family living in certain localities, and Table 508.—Average prevailing farm wage rates, by geographic divisions, are omitted.

TABLE 532.—*Coffee, Rio, No. 7: Average wholesale price per pound, New York, 1920-1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average ¹ |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----------------------|
| Av. 1921-1925..... | Cents 12.5 | Cents 13.1 | Cents 13.2 | Cents 12.8 | Cents 12.4 | Cents 13.1 | Cents 12.8 | Cents 13.0 | Cents 13.5 | Cents 13.9 | Cents 14.3 | Cents 14.2 | Cents 13.2 |
| 1920..... | 16.3 | 14.8 | 15.0 | 15.1 | 15.6 | 15.0 | 13.1 | 9.4 | 8.2 | 7.6 | 7.5 | 6.6 | 12.0 |
| 1921..... | 6.7 | 6.7 | 6.4 | 6.0 | 6.2 | 6.7 | 6.5 | 7.0 | 7.9 | 8.1 | 8.8 | 9.3 | 7.2 |
| 1922..... | 9.6 | 9.0 | 9.6 | 10.8 | 11.0 | 11.0 | 10.4 | 10.0 | 10.2 | 10.2 | 10.8 | 11.1 | 10.3 |
| 1923..... | 11.9 | 13.0 | 13.0 | 11.5 | 11.6 | 11.7 | 10.9 | 10.7 | 10.7 | 11.1 | 11.0 | 10.9 | 11.5 |
| 1924..... | 10.9 | 14.2 | 15.6 | 15.3 | 14.8 | 14.6 | 16.5 | 16.6 | 17.7 | 20.7 | 22.6 | 22.6 | 16.8 |
| 1925..... | 23.4 | 22.4 | 21.2 | 20.2 | 18.6 | 21.6 | 19.7 | 20.7 | 21.2 | 19.5 | 18.5 | 17.1 | 20.3 |
| 1926..... | 18.5 | 19.1 | 18.2 | 18.3 | 19.8 | 20.1 | 19.8 | 19.2 | 17.7 | 16.1 | 16.3 | 15.3 | 18.2 |
| 1927..... | 15.3 | 14.9 | 15.8 | 16.2 | 15.4 | 14.8 | 14.2 | 13.9 | 13.5 | 14.7 | 14.5 | 14.2 | 18.5 |
| 1928..... | 14.8 | 15.7 | 16.8 | 15.4 | 15.7 | 15.7 | 16.5 | 17.3 | 17.3 | 17.8 | 18.1 | 18.1 | 16.4 |
| 1929..... | 18.3 | 18.4 | 18.0 | 17.6 | 17.1 | 16.8 | 16.3 | 16.1 | 15.8 | 13.9 | 11.6 | 9.9 | 15.7 |

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports. Data for 1890-1919 are available in 1924 Yearbook, p. 832, Table 426.

¹ Derived from the figures upon which the monthly averages are based.

TABLE 533.—*Tea, Formosa, fine: Average wholesale price per pound, New York, 1920-1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average ¹ |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----------------------|
| Av. 1921-1925..... | Cents 30.3 | Cents 30.3 | Cents 30.3 | Cents 30.2 | Cents 29.9 | Cents 29.8 | Cents 29.8 | Cents 29.8 | Cents 30.0 | Cents 30.4 | Cents 31.6 | Cents 32.3 | Cents 30.4 |
| 1920..... | 36.5 | 36.5 | 36.5 | 36.5 | 36.5 | 36.5 | 36.5 | 34.3 | 31.0 | 31.0 | 28.6 | 23.8 | 33.7 |
| 1921..... | 24.5 | 24.5 | 24.5 | 24.1 | 22.4 | 22.0 | 22.0 | 22.0 | 22.3 | 23.0 | 28.0 | 29.0 | 24.0 |
| 1922..... | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.5 | 30.5 | 31.0 | 31.0 | 30.2 |
| 1923..... | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 |
| 1924..... | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.3 | 32.5 | 32.9 | 35.0 | 31.7 |
| 1925..... | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.3 | 35.0 |
| 1926..... | 35.5 | 35.5 | 35.5 | 35.5 | 35.5 | 35.5 | 35.5 | 35.5 | 35.5 | 35.5 | 35.5 | 35.0 | 35.5 |
| 1927..... | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 32.9 | 32.5 | 34.2 |
| 1928..... | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 31.0 | 31.0 | 31.0 | 32.1 |
| 1929..... | 32.2 | 33.0 | 33.0 | 33.0 | 33.0 | 32.5 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 30.4 | 31.8 |

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports. Data for 1890-1919 are available in 1924 Yearbook, p. 834, Table 427.

¹ Derived from the figures upon which the monthly averages are based.

TABLE 534.—*Copra, South-Sea Island: Average price per pound, in bags, f. o. b. New York, 1917-1929*

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|------|------|------|------------------|------|------|------|------|-------|------|------------------|------------------|---------|
| 1917..... | 8.2 | 8.2 | 8.1 | 8.5 | 9.1 | 9.3 | 8.6 | 9.4 | 9.3 | 9.2 | 9.8 | 9.5 | 8.9 |
| 1918..... | 9.6 | 9.6 | 9.4 | 9.5 | 9.3 | 8.8 | 9.2 | 9.2 | 9.6 | 9.4 | 9.2 | 8.8 | 9.3 |
| 1919..... | 8.8 | 7.5 | 6.6 | 7.5 | 9.5 | 10.6 | 10.9 | 10.8 | 10.2 | 9.9 | (¹) | (¹) | ----- |
| 1920..... | 11.9 | 10.9 | 10.2 | (¹) | 10.5 | 9.6 | 9.2 | 7.9 | 8.1 | 9.2 | 8.0 | 6.6 | ----- |
| 1921..... | 5.8 | 5.0 | 4.5 | 4.6 | 5.1 | 5.0 | 4.6 | 4.6 | 5.0 | 4.7 | 4.2 | 4.4 | 5.0 |
| 1922..... | 4.5 | 4.4 | 4.9 | 4.5 | 4.6 | 4.6 | 4.5 | 4.5 | 4.4 | 4.4 | 4.6 | 4.8 | 4.6 |
| 1923..... | 5.1 | 5.2 | 5.8 | 6.0 | 5.5 | 4.9 | 4.6 | 4.6 | 4.8 | 5.2 | 5.2 | 5.4 | 5.2 |
| 1924..... | 5.6 | 5.8 | 5.6 | 5.3 | 5.1 | 5.1 | 5.2 | 5.6 | 5.9 | 5.9 | 6.0 | 6.1 | 5.6 |
| 1925..... | 6.1 | 6.0 | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 | 6.0 |
| 1926..... | 6.1 | 6.1 | 6.1 | 6.1 | 6.0 | 6.1 | 6.0 | 5.6 | 5.6 | 5.6 | 5.2 | 5.1 | 5.8 |
| 1927..... | 5.0 | 5.3 | 5.1 | 5.1 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.3 | 5.2 |
| 1928..... | 5.4 | 5.5 | 5.4 | 5.4 | 5.4 | 5.3 | 5.0 | 4.9 | 4.8 | 4.8 | 4.9 | 5.0 | 5.1 |
| 1929..... | 4.8 | 4.8 | 4.7 | 4.6 | 4.3 | 4.0 | 4.4 | 4.2 | 4.4 | 4.5 | 4.3 | 4.4 | 4.4 |

Bureau of Agricultural Economics. Compiled from Oil, Paint, and Drug Reporter, 1917-1927; subsequently from Bureau of Labor Statistics Wholesale Price Bulletin.

¹ Nominal.

TABLE 585.—Coconut oil, Manila: Average price per pound, in tanks, f. o. b., Pacific Coast, 1918-1929

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Average |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1918..... | 14.06 | 12.56 | 11.62 | 12.60 | 14.78 | 16.45 | 17.84 | 16.81 | 15.90 | 15.94 | 15.48 | 15.30 | 15.30 |
| 1919..... | 18.82 | 17.50 | 17.13 | 16.88 | 16.78 | 14.80 | 12.75 | 13.12 | 13.75 | 12.75 | 11.75 | 9.52 | 14.63 |
| 1920..... | 9.69 | 8.06 | 7.25 | 7.62 | 8.22 | 8.15 | 8.25 | 8.20 | 8.20 | 8.12 | 7.90 | 7.60 | 8.11 |
| 1921..... | 7.66 | 7.46 | 7.62 | 7.50 | 7.44 | 7.00 | 7.03 | 6.95 | 6.70 | 6.88 | 7.45 | 7.80 | 7.29 |
| 1922..... | 8.22 | 8.20 | 8.68 | 9.06 | 8.54 | 8.00 | 7.88 | 7.70 | 8.25 | 8.15 | 8.33 | 8.21 | 8.28 |
| 1923..... | 8.40 | 8.31 | 8.22 | 8.01 | 7.80 | 7.81 | 8.31 | 9.34 | 8.58 | 9.19 | 9.75 | 10.02 | 8.64 |
| 1924..... | 9.88 | 9.08 | 9.17 | 8.68 | 8.72 | 8.98 | 9.24 | 9.47 | 10.29 | 11.25 | 11.88 | 10.75 | 9.78 |
| 1925..... | 10.24 | 9.67 | 9.82 | 9.56 | 9.56 | 10.26 | 9.47 | 8.78 | 8.94 | 8.28 | 8.09 | 7.84 | 9.21 |
| 1926..... | 8.06 | 8.30 | 8.06 | 8.06 | 8.19 | 8.06 | 8.12 | 8.12 | 8.31 | 8.75 | 8.69 | 8.44 | 8.26 |
| 1927..... | 8.38 | 8.12 | 8.25 | 8.31 | 8.25 | 8.06 | 8.44 | 7.69 | 7.69 | 7.81 | 7.94 | 8.12 | 8.09 |
| 1928..... | 7.98 | 7.89 | 7.62 | 7.53 | 6.87 | 6.53 | 6.98 | 6.63 | 6.63 | 6.90 | 6.81 | 6.80 | 7.10 |
| 1929..... | | | | | | | | | | | | | |

Bureau of Agricultural Economics. Compiled from weekly quotations in the Oil, Paint, and Drug Reporter. From 1918 through November, 1921, reported as 5 per cent acid.

TABLE 536.—Farm wage rates and index numbers, 1866-1929

[1910-1914=100]

| Year | Average yearly farm wage ¹ | | | | | | Weighted average wage rate per month ² | Index numbers of farm wages | Year | Average yearly farm wage ¹ | | | | | | Weighted average wage rate per month ² | Index numbers of farm wages | | | | |
|---------------------------------|---------------------------------------|---------------|------------|---------------|-------|-------|---|-----------------------------|-------------------------|---------------------------------------|---------------|------------|---------------|-------|-------|---|-----------------------------|-------|-------|-------|-------|
| | Per month— | | Per day— | | | | | | | Per month— | | Per month— | | | | | | | | | |
| | With board | Without board | With board | Without board | | | | | | With board | Without board | With board | Without board | | | | | | | | |
| | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | | | | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | | | Doll. | Doll. | Doll. | Doll. |
| 1866 ³ | 10.09 | 15.50 | 0.64 | 0.90 | 13.14 | 55 | | | 1925 ⁴ | 33.88 | 47.80 | 1.89 | 2.46 | 40.20 | 168 | | | | | | |
| 1869..... | 9.97 | 15.50 | .63 | .87 | 12.93 | 54 | | | 1926 ⁴ | 34.86 | 48.83 | 1.91 | 2.48 | 40.88 | 171 | | | | | | |
| 1874 or 1875..... | 11.16 | 17.10 | .68 | .94 | 14.19 | 59 | | | 1927 ⁴ | 34.58 | 48.63 | 1.90 | 2.46 | 40.60 | 170 | | | | | | |
| 1877 or 1879 ⁴ | 10.86 | 16.79 | .61 | .84 | 13.34 | 56 | | | 1928 ⁴ | 34.66 | 48.65 | 1.88 | 2.43 | 40.44 | 169 | | | | | | |
| 1879 or 1880..... | 11.70 | 17.53 | .64 | .89 | 14.14 | 59 | | | 1929 ⁴ | | | | | | | | | | | | |
| 1880 or 1881..... | 12.32 | 18.52 | .67 | .92 | 14.82 | 62 | | | 1923—January..... | 27.87 | 40.50 | 1.46 | 1.97 | 32.61 | 137 | | | | | | |
| 1881 or 1882..... | 12.86 | 19.11 | .70 | .97 | 15.48 | 65 | | | April..... | 30.90 | 44.41 | 1.55 | 2.09 | 35.42 | 148 | | | | | | |
| 1884 or 1885..... | 13.08 | 19.22 | .71 | .96 | 15.58 | 65 | | | July..... | 34.64 | 48.61 | 1.84 | 2.44 | 40.30 | 169 | | | | | | |
| 1887 or 1888..... | 13.29 | 19.47 | .72 | .98 | 15.87 | 66 | | | October..... | 34.56 | 48.42 | 2.02 | 2.58 | 41.52 | 174 | | | | | | |
| 1889 or 1890..... | 13.29 | 19.46 | .72 | .97 | 15.79 | 66 | | | 1924—January..... | 31.55 | 45.53 | 1.70 | 2.38 | 38.01 | 159 | | | | | | |
| 1891 or 1892..... | 13.48 | 20.02 | .73 | .98 | 16.06 | 67 | | | April..... | 33.57 | 47.38 | 1.77 | 2.34 | 38.95 | 163 | | | | | | |
| 1893..... | 13.85 | 19.97 | .72 | .92 | 15.93 | 67 | | | July..... | 34.34 | 48.02 | 1.87 | 2.43 | 40.15 | 168 | | | | | | |
| 1894..... | 12.70 | 18.57 | .65 | .84 | 14.60 | 61 | | | October..... | 34.38 | 48.46 | 1.93 | 2.51 | 40.81 | 171 | | | | | | |
| 1895..... | 12.75 | 18.74 | .65 | .85 | 14.69 | 62 | | | 1925—January..... | 31.07 | 45.04 | 1.74 | 2.31 | 37.24 | 156 | | | | | | |
| 1896..... | 13.29 | 19.16 | .71 | .94 | 15.58 | 65 | | | April..... | 33.86 | 47.40 | 1.77 | 2.33 | 39.04 | 164 | | | | | | |
| 1898..... | 13.90 | 19.97 | .75 | .99 | 16.34 | 68 | | | July..... | 34.91 | 48.55 | 1.89 | 2.44 | 40.62 | 170 | | | | | | |
| 1899..... | 15.51 | 22.12 | .83 | 1.09 | 18.12 | 76 | | | October..... | 34.91 | 48.99 | 1.95 | 2.53 | 41.28 | 173 | | | | | | |
| 1902..... | 18.73 | 26.19 | 1.03 | 1.32 | 21.92 | 92 | | | 1926—January..... | 31.82 | 46.26 | 1.76 | 2.33 | 37.94 | 159 | | | | | | |
| 1906..... | 20.48 | 28.09 | 1.04 | 1.31 | 23.00 | 96 | | | April..... | 31.38 | 48.40 | 1.78 | 2.35 | 39.56 | 166 | | | | | | |
| 1909..... | 19.58 | 28.04 | 1.07 | 1.40 | 23.08 | 97 | | | July..... | 36.10 | 49.89 | 1.91 | 2.47 | 41.55 | 174 | | | | | | |
| 1910..... | 19.85 | 28.33 | 1.07 | 1.40 | 23.25 | 97 | | | October..... | 36.00 | 50.10 | 1.97 | 2.53 | 42.10 | 176 | | | | | | |
| 1911..... | 20.46 | 29.14 | 1.11 | 1.44 | 24.01 | 101 | | | 1927—January..... | 32.94 | 47.07 | 1.79 | 2.36 | 38.79 | 161 | | | | | | |
| 1912..... | 21.27 | 30.21 | 1.12 | 1.44 | 24.01 | 104 | | | April..... | 34.53 | 48.47 | 1.78 | 2.37 | 39.71 | 162 | | | | | | |
| 1913..... | 21.27 | 30.21 | 1.15 | 1.48 | 24.82 | 101 | | | July..... | 35.59 | 49.52 | 1.89 | 2.44 | 41.07 | 172 | | | | | | |
| 1914..... | 20.90 | 29.72 | 1.11 | 1.44 | 24.26 | 102 | | | October..... | 35.68 | 49.77 | 1.96 | 2.51 | 41.71 | 175 | | | | | | |
| 1915..... | 21.08 | 29.97 | 1.12 | 1.45 | 24.46 | 102 | | | 1928—January..... | 32.50 | 46.75 | 1.76 | 2.34 | 38.56 | 161 | | | | | | |
| 1916..... | 23.04 | 32.58 | 1.24 | 1.60 | 26.83 | 140 | | | April..... | 34.46 | 48.44 | 1.78 | 2.39 | 40.55 | 170 | | | | | | |
| 1917..... | 28.64 | 40.19 | 1.56 | 2.00 | 33.42 | 176 | | | July..... | 35.39 | 49.32 | 1.84 | 2.39 | 40.55 | 171 | | | | | | |
| 1918..... | 35.12 | 49.13 | 2.05 | 2.61 | 42.12 | 206 | | | October..... | 35.75 | 49.60 | 1.96 | 2.51 | 41.71 | 175 | | | | | | |
| 1919..... | 40.14 | 56.77 | 2.44 | 3.10 | 49.11 | 239 | | | 1929—January..... | 33.04 | 47.24 | 1.78 | 2.34 | 38.80 | 167 | | | | | | |
| 1920..... | 47.24 | 65.05 | 2.84 | 3.56 | 57.01 | 239 | | | April..... | 34.68 | 49.00 | 1.79 | 2.43 | 41.79 | 173 | | | | | | |
| 1921..... | 30.25 | 43.58 | 1.66 | 2.17 | 35.77 | 150 | | | July..... | 36.08 | 50.53 | 1.89 | 2.43 | 41.42 | 174 | | | | | | |
| 1922..... | 29.31 | 42.09 | 1.64 | 2.14 | 34.91 | 146 | | | October..... | 35.90 | 50.00 | 1.92 | 2.46 | 41.49 | 174 | | | | | | |
| 1923..... | 33.09 | 46.74 | 1.91 | 2.45 | 39.64 | 166 | | | | | | | | | | | | | | | |
| 1924 ⁴ | 33.34 | 47.22 | 1.88 | 2.44 | 39.67 | 166 | | | | | | | | | | | | | | | |

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¹ Yearly averages are from reports by crop reporters, giving average wages for the year in their localities.

² This column has significance only as an essential step in computing the wage index.

³ Years 1866 to 1878 in gold.

⁴ 1877 or 1878, 1878 or 1879 (combined).

⁵ Weighted average of quarterly reports, April (weight 1), July (weight 5), October (weight 5), and January of the following year (weight 1).

TABLE 537.—Wages: Male farm labor, by States, quarterly, 1929

| State and division | Per month, with board | | | | Per month, without board | | | | Per day, with board ¹ | | | | Per day, without board | | | |
|---------------------|-----------------------|-------|-------|-------|--------------------------|-------|-------|-------|----------------------------------|-------|-------|-------|------------------------|-------|-------|-------|
| | Jan. | Apr. | July | Oct. | Jan. | Apr. | July | Oct. | Jan. | Apr. | July | Oct. | Jan. | Apr. | July | Oct. |
| | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. | Doll. |
| Malne..... | 40.00 | 43.00 | 50.25 | 49.00 | 62.00 | 64.00 | 66.50 | 71.00 | 2.25 | 2.30 | 2.45 | 2.80 | 2.90 | 3.00 | 3.10 | 3.45 |
| New Hampshire..... | 45.00 | 48.00 | 53.50 | 49.00 | 72.00 | 75.00 | 81.00 | 72.00 | 2.60 | 2.35 | 2.70 | 2.60 | 3.40 | 3.35 | 3.60 | 3.50 |
| Vermont..... | 47.00 | 48.00 | 51.25 | 40.00 | 68.00 | 71.00 | 73.25 | 72.00 | 2.15 | 2.40 | 2.60 | 2.60 | 3.25 | 3.20 | 3.35 | 3.45 |
| Massachusetts..... | 49.00 | 50.00 | 53.75 | 51.00 | 77.00 | 82.00 | 84.00 | 80.00 | 2.50 | 2.45 | 2.95 | 2.80 | 3.65 | 3.65 | 3.80 | 3.80 |
| Rhode Island..... | 50.00 | 54.00 | 54.00 | 56.00 | 80.00 | 86.00 | 86.75 | 85.00 | 2.60 | 2.75 | 2.95 | 2.80 | 3.65 | 3.60 | 3.85 | 3.85 |
| Connecticut..... | 52.00 | 56.00 | 54.75 | 54.00 | 81.00 | 84.00 | 84.00 | 86.00 | 2.70 | 2.90 | 2.85 | 3.10 | 3.80 | 3.75 | 3.85 | 4.00 |
| New York..... | 44.75 | 49.25 | 50.25 | 50.00 | 66.00 | 70.25 | 72.25 | 70.75 | 2.70 | 2.80 | 3.05 | 3.05 | 3.55 | 3.65 | 3.85 | 3.85 |
| New Jersey..... | 48.00 | 49.25 | 50.50 | 51.00 | 71.00 | 72.00 | 72.50 | 76.00 | 2.80 | 2.65 | 2.75 | 2.75 | 3.60 | 3.50 | 3.55 | 3.65 |
| Pennsylvania..... | 37.25 | 38.25 | 41.00 | 40.25 | 59.00 | 58.75 | 62.00 | 60.00 | 2.45 | 2.45 | 2.55 | 2.60 | 3.20 | 3.20 | 3.25 | 3.30 |
| North Atlantic..... | 43.48 | 46.12 | 48.35 | 47.72 | 66.22 | 68.74 | 70.97 | 69.90 | 2.56 | 2.60 | 2.79 | 2.83 | 3.42 | 3.44 | 3.57 | 3.63 |
| Ohio..... | 37.75 | 37.00 | 38.75 | 38.75 | 53.50 | 52.75 | 54.00 | 54.50 | 2.30 | 2.30 | 2.40 | 2.50 | 3.00 | 3.05 | 3.05 | 3.15 |
| Indiana..... | 34.75 | 36.50 | 38.75 | 37.25 | 47.25 | 49.50 | 51.75 | 50.00 | 2.00 | 2.05 | 2.20 | 2.30 | 2.60 | 2.60 | 2.75 | 2.85 |
| Illinois..... | 41.00 | 43.00 | 43.25 | 43.00 | 53.25 | 55.00 | 56.00 | 55.25 | 2.25 | 2.20 | 2.30 | 2.40 | 2.90 | 2.75 | 2.90 | 2.90 |
| Michigan..... | 39.25 | 42.50 | 43.75 | 44.25 | 55.25 | 60.00 | 61.50 | 61.75 | 2.50 | 2.60 | 2.65 | 2.75 | 3.25 | 3.30 | 3.35 | 3.35 |
| Wisconsin..... | 40.00 | 48.00 | 50.50 | 49.25 | 57.75 | 66.00 | 69.50 | 67.50 | 2.30 | 2.30 | 2.55 | 2.55 | 2.90 | 3.00 | 3.25 | 3.15 |
| Minnesota..... | 33.25 | 44.50 | 47.75 | 46.25 | 49.50 | 60.00 | 65.00 | 63.00 | 1.95 | 2.25 | 2.40 | 2.60 | 2.75 | 3.05 | 3.20 | 3.40 |
| Iowa..... | 44.00 | 49.00 | 49.00 | 48.75 | 56.00 | 59.75 | 60.25 | 60.25 | 2.40 | 2.40 | 2.55 | 2.55 | 3.00 | 3.05 | 3.15 | 3.20 |
| Missouri..... | 33.00 | 33.25 | 34.25 | 34.50 | 44.00 | 44.50 | 45.25 | 45.75 | 1.65 | 1.60 | 1.75 | 1.75 | 2.15 | 2.15 | 2.20 | 2.15 |
| North Dakota..... | 27.75 | 44.75 | 48.25 | 47.75 | 43.00 | 65.00 | 66.00 | 63.75 | 1.70 | 2.25 | 2.45 | 2.45 | 2.55 | 3.10 | 3.25 | 3.75 |
| South Dakota..... | 35.00 | 46.50 | 49.50 | 46.50 | 51.00 | 65.75 | 67.00 | 66.75 | 2.15 | 2.35 | 2.40 | 2.80 | 3.05 | 3.20 | 3.30 | 3.55 |
| Nebraska..... | 40.75 | 44.00 | 45.25 | 44.00 | 55.75 | 59.00 | 60.00 | 67.75 | 2.40 | 2.35 | 2.45 | 2.50 | 3.15 | 3.10 | 3.35 | 3.30 |
| Kansas..... | 37.00 | 37.25 | 39.25 | 39.00 | 52.00 | 52.75 | 55.00 | 54.75 | 2.45 | 2.25 | 2.65 | 2.50 | 3.10 | 2.95 | 3.35 | 3.20 |
| North Central..... | 37.49 | 41.81 | 43.40 | 42.79 | 51.74 | 56.44 | 58.18 | 57.41 | 2.17 | 2.21 | 2.36 | 2.43 | 2.83 | 2.88 | 3.02 | 3.07 |
| Delaware..... | 33.00 | 37.25 | 37.00 | 35.50 | 47.00 | 55.00 | 55.50 | 53.50 | 2.25 | 2.26 | 2.25 | 2.40 | 3.00 | 2.75 | 2.75 | 3.05 |
| Maryland..... | 34.75 | 35.00 | 36.00 | 35.25 | 50.25 | 50.50 | 52.25 | 50.75 | 1.95 | 1.95 | 1.10 | 2.20 | 2.65 | 2.60 | 2.75 | 2.85 |
| Virginia..... | 30.00 | 30.00 | 30.00 | 31.00 | 41.00 | 43.00 | 43.00 | 43.00 | 1.55 | 1.55 | 1.55 | 1.60 | 2.00 | 2.00 | 2.05 | 2.00 |
| West Virginia..... | 32.25 | 30.00 | 32.50 | 33.50 | 47.25 | 46.25 | 46.50 | 48.50 | 1.65 | 1.65 | 1.65 | 1.65 | 2.20 | 2.25 | 2.30 | 2.30 |
| North Carolina..... | 27.00 | 28.25 | 26.75 | 28.75 | 40.00 | 38.50 | 38.25 | 39.25 | 1.40 | 1.40 | 1.46 | 1.40 | 1.85 | 1.80 | 1.80 | 1.80 |
| South Carolina..... | 19.00 | 19.25 | 19.00 | 19.50 | 27.00 | 26.75 | 26.75 | 27.50 | 1.00 | .95 | 1.00 | .95 | 1.25 | 1.25 | 1.20 | 1.20 |
| Georgia..... | 18.50 | 18.25 | 19.75 | 19.75 | 25.00 | 26.50 | 26.25 | 28.00 | 1.00 | 1.00 | 1.05 | 1.05 | 1.25 | 1.25 | 1.30 | 1.35 |
| Florida..... | 23.00 | 22.00 | 24.50 | 23.75 | 35.00 | 34.50 | 36.50 | 36.25 | 1.15 | 1.15 | 1.20 | 1.15 | 1.55 | 1.55 | 1.65 | 1.60 |
| South Atlantic..... | 24.47 | 24.20 | 24.98 | 25.52 | 35.18 | 35.10 | 35.77 | 36.02 | 1.29 | 1.28 | 1.31 | 1.32 | 1.69 | 1.66 | 1.70 | 1.71 |
| Kentucky..... | 25.75 | 26.25 | 27.00 | 27.50 | 36.25 | 36.50 | 38.25 | 38.75 | 1.30 | 1.30 | 1.40 | 1.40 | 1.70 | 1.65 | 1.80 | 1.80 |
| Tennessee..... | 23.00 | 23.50 | 24.00 | 25.00 | 32.50 | 32.75 | 33.50 | 34.75 | 1.15 | 1.15 | 1.15 | 1.20 | 1.50 | 1.55 | 1.55 | 1.50 |
| Alabama..... | 22.00 | 21.00 | 22.00 | 21.00 | 31.00 | 30.00 | 30.00 | 27.00 | 1.10 | 1.10 | 1.10 | 1.10 | 1.50 | 1.50 | 1.40 | 1.40 |
| Mississippi..... | 21.75 | 22.00 | 23.25 | 22.50 | 31.50 | 31.50 | 32.75 | 32.25 | 1.15 | 1.15 | 1.15 | 1.15 | 1.50 | 1.55 | 1.65 | 1.60 |
| Arkansas..... | 25.00 | 24.00 | 26.50 | 24.50 | 36.00 | 34.50 | 38.00 | 35.25 | 1.20 | 1.20 | 1.30 | 1.30 | 1.60 | 1.60 | 1.65 | 1.70 |
| Louisiana..... | 25.00 | 24.00 | 26.50 | 24.50 | 36.00 | 36.75 | 39.75 | 37.75 | 1.25 | 1.20 | 1.20 | 1.25 | 1.60 | 1.50 | 1.50 | 1.55 |
| Oklahoma..... | 27.75 | 28.25 | 29.00 | 30.50 | 40.75 | 41.50 | 41.50 | 42.50 | 1.55 | 1.50 | 1.75 | 1.70 | 2.15 | 1.95 | 2.05 | 2.20 |
| Texas..... | 28.75 | 28.25 | 30.00 | 29.00 | 41.50 | 40.75 | 42.50 | 42.00 | 1.45 | 1.40 | 1.55 | 1.45 | 1.85 | 1.80 | 1.95 | 1.90 |
| South Central..... | 25.26 | 25.00 | 26.39 | 25.86 | 36.23 | 35.95 | 37.44 | 36.70 | 1.28 | 1.26 | 1.34 | 1.32 | 1.68 | 1.65 | 1.71 | 1.72 |
| Montana..... | 46.25 | 54.50 | 57.50 | 57.25 | 67.50 | 74.75 | 78.75 | 77.00 | 2.60 | 2.60 | 2.85 | 3.05 | 3.60 | 3.70 | 3.70 | 3.80 |
| Idaho..... | 40.00 | 55.00 | 60.25 | 58.00 | 69.50 | 76.25 | 81.75 | 80.75 | 2.45 | 2.55 | 2.85 | 2.90 | 3.10 | 3.15 | 3.60 | 3.80 |
| Wyoming..... | 49.50 | 49.75 | 51.50 | 53.00 | 68.00 | 72.25 | 75.50 | 75.75 | 2.40 | 2.35 | 2.60 | 2.65 | 3.15 | 3.15 | 3.45 | 3.45 |
| Colorado..... | 40.00 | 41.25 | 42.50 | 45.00 | 61.00 | 62.50 | 63.75 | 66.50 | 2.40 | 2.30 | 2.30 | 2.45 | 3.00 | 2.95 | 3.05 | 3.00 |
| New Mexico..... | 35.25 | 34.75 | 36.00 | 36.00 | 50.50 | 51.00 | 52.00 | 52.00 | 1.75 | 1.65 | 1.80 | 1.90 | 2.20 | 2.05 | 2.20 | 2.30 |
| Arizona..... | 52.00 | 49.00 | 55.00 | 50.00 | 66.00 | 71.00 | 71.00 | 66.50 | 2.05 | 2.00 | 2.15 | 1.90 | 2.50 | 2.55 | 2.75 | 2.60 |
| Utah..... | 53.45 | 55.25 | 53.50 | 54.00 | 72.00 | 73.75 | 83.75 | 82.50 | 2.40 | 2.30 | 2.60 | 2.55 | 3.05 | 3.00 | 3.25 | 3.25 |
| Nevada..... | 63.00 | 58.00 | 60.25 | 65.00 | 81.00 | 75.50 | 83.00 | 91.00 | 2.40 | 2.35 | 2.60 | 2.75 | 3.10 | 3.25 | 3.25 | 3.75 |
| Washington..... | 45.00 | 52.00 | 51.75 | 54.00 | 70.75 | 74.00 | 78.25 | 78.00 | 2.55 | 2.50 | 2.65 | 2.80 | 3.45 | 3.40 | 3.65 | 3.65 |
| Oregon..... | 46.00 | 49.00 | 51.25 | 54.00 | 67.75 | 71.25 | 74.50 | 74.00 | 2.35 | 2.40 | 2.45 | 2.70 | 3.10 | 3.10 | 3.20 | 3.40 |
| California..... | 62.00 | 62.00 | 62.00 | 64.00 | 90.00 | 90.00 | 90.00 | 90.00 | 2.60 | 2.60 | 2.60 | 2.60 | 3.60 | 3.55 | 3.55 | 3.60 |
| Far Western..... | 51.54 | 53.44 | 55.28 | 56.54 | 74.72 | 76.99 | 79.11 | 78.93 | 2.44 | 2.42 | 2.51 | 2.57 | 3.24 | 3.21 | 3.32 | 3.39 |
| United States..... | 33.04 | 34.68 | 36.08 | 35.90 | 47.24 | 49.00 | 50.53 | 50.00 | 1.78 | 1.79 | 1.89 | 1.92 | 2.34 | 2.34 | 2.43 | 2.46 |

Bureau of Agricultural Economics. As reported by field and crop reporters.

¹ Includes piecework.

TABLE 538.—Percentages of farmers reporting hiring farm laborers, United States, 1927

[9,531 reports=100 per cent]

| Class of labor and geographic division | Number of reports | In January | In February | In March | In April | In May | In June |
|--|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Class of labor: | Number | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent |
| Month, with board..... | ..... | 17.2 | 17.8 | 21.7 | 24.7 | 25.7 | 26.0 |
| Month, without board..... | ..... | 13.2 | 13.4 | 14.7 | 15.2 | 15.3 | 15.5 |
| Day, with board..... | ..... | 7.2 | 6.2 | 8.3 | 9.7 | 11.4 | 15.0 |
| Day, without board..... | ..... | 8.8 | 9.0 | 10.0 | 11.0 | 12.6 | 13.9 |
| One or more classes..... | ..... | 39.6 | 40.1 | 46.5 | 50.9 | 53.8 | 56.2 |
| Geographic divisions: | | | | | | | |
| New England..... | 332 | 58.4 | 58.1 | 62.0 | 64.8 | 70.5 | 67.8 |
| Middle Atlantic..... | 1,101 | 42.1 | 41.8 | 46.5 | 52.9 | 54.7 | 56.3 |
| East North Central..... | 2,156 | 34.6 | 35.3 | 43.0 | 47.6 | 50.0 | 52.4 |
| West North Central..... | 2,402 | 36.6 | 36.9 | 45.1 | 50.5 | 53.0 | 56.5 |
| South Atlantic..... | 992 | 48.0 | 48.1 | 53.4 | 55.3 | 58.7 | 59.8 |
| East South Central..... | 776 | 42.3 | 42.7 | 48.8 | 51.4 | 52.8 | 54.5 |
| West South Central..... | 1,053 | 39.0 | 41.2 | 45.3 | 47.1 | 53.1 | 56.4 |
| Mountain..... | 390 | 33.6 | 33.8 | 39.5 | 50.4 | 54.6 | 55.4 |
| Pacific..... | 329 | 44.4 | 44.7 | 50.2 | 52.9 | 53.2 | 60.2 |
| United States..... | 9,531 | 39.6 | 40.1 | 46.5 | 50.9 | 53.8 | 56.2 |

| Class of labor and geographic division | In July | In August | In September | In October | In November | In December | During the year 1927 |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------|
| Class of labor: | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent |
| Month, with board..... | 26.1 | 24.7 | 23.5 | 22.5 | 20.6 | 17.9 | 30.9 |
| Month, without board..... | 15.3 | 14.8 | 14.5 | 14.4 | 13.8 | 12.9 | 17.6 |
| Day, with board..... | 21.9 | 19.8 | 18.8 | 17.4 | 15.5 | 9.0 | 38.5 |
| Day, without board..... | 15.9 | 14.3 | 16.0 | 16.3 | 14.2 | 9.9 | 28.7 |
| One or more classes..... | 61.2 | 57.2 | 56.8 | 55.8 | 52.0 | 42.4 | 76.4 |
| Geographic divisions: | | | | | | | |
| New England..... | 78.9 | 74.1 | 72.9 | 71.4 | 66.9 | 58.7 | 86.4 |
| Middle Atlantic..... | 67.8 | 63.5 | 61.8 | 61.9 | 54.0 | 45.7 | 79.0 |
| East North Central..... | 59.8 | 55.7 | 53.3 | 53.3 | 48.5 | 38.3 | 72.2 |
| West North Central..... | 63.2 | 59.3 | 55.0 | 52.2 | 53.2 | 41.4 | 78.1 |
| South Atlantic..... | 61.6 | 56.2 | 61.2 | 61.4 | 59.1 | 49.1 | 75.2 |
| East South Central..... | 51.2 | 45.5 | 52.3 | 51.5 | 50.3 | 43.4 | 69.6 |
| West South Central..... | 50.6 | 48.4 | 53.5 | 55.4 | 47.9 | 39.8 | 76.7 |
| Mountain..... | 62.6 | 63.3 | 64.9 | 57.4 | 46.4 | 35.9 | 84.1 |
| Pacific..... | 69.6 | 64.1 | 57.4 | 54.4 | 48.0 | 41.6 | 83.3 |
| United States..... | 61.2 | 57.2 | 56.8 | 55.8 | 52.0 | 42.4 | 76.4 |

Bureau of Agricultural Economics. The reports were those of voluntary correspondents of the Department of Agriculture.

TABLE 539.—*Total cash wages paid to hired farm laborers per farm reporting hiring labor of designated classes, United States, 1927*

| Class of labor and geographic division | In January | In February | In March | In April | In May | In June | In July |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Class of labor: | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| Month, with board..... | 54.00 | 51.30 | 54.15 | 59.91 | 64.59 | 67.56 | 73.20 |
| Month, without board..... | 83.68 | 83.19 | 86.53 | 95.04 | 97.59 | 104.81 | 106.87 |
| Day, with board..... | 22.82 | 20.14 | 22.38 | 26.27 | 29.47 | 37.48 | 44.11 |
| Day, without board..... | 50.02 | 43.03 | 44.34 | 50.15 | 54.05 | 60.02 | 70.47 |
| One or more classes..... | 66.48 | 63.49 | 66.12 | 73.18 | 77.68 | 85.12 | 92.10 |
| Geographic divisions: | | | | | | | |
| New England..... | 110.27 | 104.84 | 105.26 | 112.10 | 115.95 | 128.64 | 150.67 |
| Middle Atlantic..... | 66.60 | 65.48 | 67.19 | 72.48 | 74.95 | 84.02 | 85.97 |
| East North Central..... | 50.53 | 49.25 | 53.86 | 50.86 | 63.37 | 67.08 | 71.42 |
| West North Central..... | 51.13 | 49.47 | 53.50 | 62.64 | 66.29 | 70.21 | 80.44 |
| South Atlantic..... | 58.77 | 59.26 | 61.79 | 68.47 | 69.81 | 76.26 | 81.82 |
| East South Central..... | 37.05 | 36.42 | 37.67 | 43.43 | 46.81 | 55.42 | 53.42 |
| West South Central..... | 68.16 | 63.35 | 63.56 | 72.30 | 72.40 | 81.59 | 89.94 |
| Mountain..... | 108.20 | 109.16 | 110.18 | 111.52 | 123.10 | 149.07 | 146.19 |
| Pacific..... | 231.00 | 195.40 | 211.16 | 221.52 | 266.81 | 274.81 | 280.68 |
| United States..... | 66.48 | 63.49 | 66.12 | 73.18 | 77.68 | 85.12 | 92.10 |

| Class of labor and geographic division | In August | In September | In October | In November | In December | During year 1927 |
|--|----------------|----------------|----------------|----------------|----------------|------------------|
| Class of labor: | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| Month, with board..... | 73.88 | 70.71 | 65.94 | 63.80 | 58.10 | 554.76 |
| Month, without board..... | 110.62 | 112.12 | 110.36 | 96.49 | 90.39 | 967.80 |
| Day, with board..... | 46.77 | 53.07 | 46.20 | 45.43 | 35.80 | 164.81 |
| Day, without board..... | 72.39 | 84.88 | 96.92 | 69.18 | 59.14 | 349.09 |
| One or more classes..... | 94.83 | 99.39 | 97.93 | 83.15 | 73.64 | 661.22 |
| Geographic divisions: | | | | | | |
| New England..... | 143.96 | 149.63 | 148.75 | 117.58 | 119.31 | 1,181.84 |
| Middle Atlantic..... | 84.67 | 90.66 | 94.98 | 75.20 | 66.91 | 647.10 |
| East North Central..... | 77.02 | 68.56 | 74.55 | 66.49 | 63.28 | 514.69 |
| West North Central..... | 85.21 | 102.19 | 87.25 | 79.84 | 64.10 | 563.00 |
| South Atlantic..... | 79.77 | 82.51 | 87.05 | 64.51 | 59.93 | 639.45 |
| East South Central..... | 51.91 | 51.99 | 50.22 | 42.37 | 40.67 | 387.77 |
| West South Central..... | 80.82 | 98.74 | 106.13 | 96.95 | 79.76 | 618.23 |
| Mountain..... | 182.71 | 152.73 | 156.09 | 128.66 | 119.64 | 977.11 |
| Pacific..... | 279.96 | 320.89 | 311.07 | 275.42 | 228.96 | 2,012.78 |
| United States..... | 94.83 | 99.39 | 97.93 | 83.15 | 73.64 | 661.22 |

Bureau of Agricultural Economics. The reports were those of voluntary correspondents of the Department of Agriculture.

TABLE 540.—*Farm real estate: Index numbers of estimated value per acre, by geographic divisions and States, 1912-1929*¹

[1912-1914=100 per cent.]

| Geographic division and State | 1912 | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|-------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| United States..... | 97 | 100 | 103 | 103 | 108 | 117 | 129 | 140 | 170 | 157 | 139 | 135 | 130 | 127 | 124 | 119 | 117 | 116 |
| Geographic divisions: | | | | | | | | | | | | | | | | | | |
| New England..... | 99 | 101 | 100 | 99 | 102 | 112 | 117 | 123 | 140 | 135 | 134 | 130 | 128 | 127 | 128 | 127 | 127 | 126 |
| Middle Atlantic..... | 98 | 100 | 102 | 100 | 104 | 112 | 117 | 121 | 136 | 127 | 118 | 116 | 114 | 114 | 113 | 111 | 110 | 109 |
| East North Central..... | 97 | 100 | 103 | 103 | 110 | 116 | 127 | 135 | 161 | 151 | 132 | 128 | 121 | 116 | 111 | 104 | 101 | 100 |
| West North Central..... | 97 | 100 | 103 | 105 | 114 | 122 | 134 | 147 | 184 | 174 | 150 | 142 | 132 | 126 | 121 | 115 | 113 | 112 |
| South Atlantic..... | 98 | 100 | 103 | 98 | 108 | 119 | 135 | 161 | 198 | 174 | 146 | 152 | 151 | 148 | 149 | 137 | 134 | 133 |
| East South Central..... | 97 | 100 | 103 | 99 | 109 | 120 | 140 | 162 | 199 | 163 | 149 | 149 | 142 | 141 | 139 | 133 | 130 | 129 |
| West South Central..... | 96 | 100 | 104 | 100 | 103 | 116 | 134 | 143 | 177 | 159 | 136 | 132 | 136 | 144 | 144 | 139 | 137 | 136 |
| Mountain..... | 98 | 102 | 100 | 98 | 98 | 106 | 117 | 130 | 151 | 133 | 122 | 115 | 110 | 105 | 103 | 101 | 101 | 101 |
| Pacific..... | 94 | 99 | 106 | 107 | 111 | 122 | 129 | 134 | 156 | 155 | 151 | 148 | 147 | 146 | 144 | 143 | 142 | 142 |
| New England: | | | | | | | | | | | | | | | | | | |
| Maine..... | 100 | 102 | 98 | 96 | 98 | 110 | 115 | 124 | 142 | 132 | 127 | 129 | 127 | 124 | 126 | 124 | 124 | 122 |
| New Hampshire..... | 97 | 101 | 102 | 101 | 98 | 103 | 111 | 116 | 129 | 123 | 126 | 111 | 109 | 111 | 113 | 112 | 112 | 111 |
| Vermont..... | 101 | 101 | 98 | 104 | 115 | 127 | 133 | 136 | 150 | 150 | 145 | 134 | 130 | 125 | 126 | 125 | 123 | 123 |
| Massachusetts..... | 98 | 100 | 102 | 98 | 100 | 110 | 114 | 119 | 140 | 134 | 134 | 132 | 131 | 132 | 134 | 131 | 131 | 131 |
| Rhode Island..... | 100 | 101 | 100 | 102 | 106 | 112 | 118 | 123 | 130 | 130 | 127 | 124 | 126 | 128 | 130 | 133 | 134 | 134 |
| Connecticut..... | 98 | 100 | 102 | 100 | 102 | 110 | 116 | 121 | 137 | 134 | 140 | 137 | 140 | 137 | 137 | 138 | 139 | 139 |
| Middle Atlantic: | | | | | | | | | | | | | | | | | | |
| New York..... | 98 | 100 | 102 | 100 | 103 | 109 | 115 | 118 | 133 | 133 | 121 | 115 | 112 | 111 | 109 | 108 | 106 | 105 |
| New Jersey..... | 98 | 100 | 102 | 100 | 102 | 111 | 115 | 119 | 130 | 130 | 116 | 115 | 120 | 124 | 129 | 128 | 127 | 127 |
| Pennsylvania..... | 98 | 100 | 102 | 100 | 105 | 114 | 119 | 124 | 140 | 131 | 120 | 118 | 116 | 114 | 114 | 112 | 111 | 110 |
| East North Central: | | | | | | | | | | | | | | | | | | |
| Ohio..... | 98 | 100 | 102 | 107 | 113 | 119 | 131 | 135 | 159 | 134 | 124 | 122 | 118 | 110 | 105 | 99 | 96 | 94 |
| Indiana..... | 98 | 100 | 102 | 101 | 110 | 116 | 128 | 135 | 161 | 147 | 119 | 115 | 108 | 102 | 95 | 87 | 84 | 83 |
| Illinois..... | 97 | 100 | 103 | 102 | 106 | 111 | 119 | 130 | 160 | 153 | 126 | 123 | 116 | 115 | 109 | 99 | 96 | 95 |
| Michigan..... | 98 | 99 | 103 | 105 | 111 | 120 | 134 | 137 | 154 | 152 | 148 | 145 | 138 | 133 | 129 | 127 | 125 | 124 |
| Wisconsin..... | 97 | 100 | 103 | 104 | 117 | 124 | 133 | 143 | 171 | 168 | 154 | 147 | 139 | 130 | 125 | 122 | 120 | 119 |
| West North Central: | | | | | | | | | | | | | | | | | | |
| Minnesota..... | 95 | 100 | 105 | 107 | 122 | 138 | 155 | 167 | 213 | 212 | 187 | 177 | 170 | 159 | 155 | 145 | 140 | 138 |
| Iowa..... | 96 | 99 | 104 | 112 | 128 | 134 | 145 | 160 | 213 | 197 | 162 | 156 | 143 | 136 | 130 | 121 | 117 | 116 |
| Missouri..... | 97 | 100 | 103 | 102 | 108 | 115 | 125 | 137 | 167 | 156 | 133 | 127 | 117 | 112 | 104 | 98 | 96 | 95 |
| North Dakota..... | 97 | 100 | 103 | 103 | 112 | 118 | 124 | 130 | 145 | 141 | 136 | 128 | 114 | 109 | 105 | 100 | 99 | 98 |
| South Dakota..... | 96 | 101 | 103 | 101 | 108 | 116 | 126 | 145 | 181 | 173 | 146 | 126 | 117 | 115 | 107 | 97 | 96 | 95 |
| Nebraska..... | 98 | 100 | 102 | 101 | 104 | 110 | 127 | 145 | 179 | 166 | 144 | 139 | 128 | 123 | 123 | 119 | 117 | 116 |
| Kansas..... | 101 | 99 | 99 | 103 | 109 | 116 | 122 | 132 | 151 | 149 | 130 | 127 | 118 | 115 | 113 | 113 | 113 | 113 |
| South Atlantic: | | | | | | | | | | | | | | | | | | |
| Delaware..... | 100 | 101 | 99 | 100 | 105 | 115 | 124 | 129 | 139 | 129 | 119 | 119 | 107 | 112 | 114 | 111 | 111 | 111 |
| Maryland..... | 97 | 100 | 103 | 104 | 109 | 118 | 129 | 136 | 166 | 146 | 141 | 136 | 133 | 131 | 130 | 126 | 124 | 123 |
| Virginia..... | 97 | 100 | 103 | 97 | 117 | 125 | 142 | 167 | 189 | 180 | 157 | 170 | 162 | 154 | 148 | 138 | 137 | 136 |
| West Virginia..... | 97 | 100 | 103 | 101 | 104 | 112 | 122 | 135 | 154 | 141 | 125 | 127 | 125 | 120 | 116 | 110 | 109 | 108 |
| North Carolina..... | 97 | 99 | 104 | 102 | 114 | 130 | 152 | 176 | 223 | 196 | 166 | 195 | 192 | 187 | 185 | 178 | 174 | 171 |
| South Carolina..... | 101 | 98 | 101 | 94 | 98 | 107 | 122 | 162 | 230 | 186 | 126 | 128 | 136 | 138 | 128 | 113 | 110 | 110 |
| Georgia..... | 98 | 101 | 101 | 94 | 105 | 116 | 131 | 172 | 217 | 172 | 136 | 125 | 123 | 116 | 112 | 104 | 102 | 101 |
| Florida..... | 96 | 99 | 105 | 97 | 103 | 109 | 126 | 143 | 178 | 176 | 157 | 155 | 163 | 172 | 223 | 183 | 176 | 174 |
| East South Central: | | | | | | | | | | | | | | | | | | |
| Kentucky..... | 97 | 100 | 103 | 100 | 111 | 127 | 146 | 170 | 200 | 172 | 151 | 147 | 141 | 140 | 139 | 134 | 130 | 129 |
| Tennessee..... | 96 | 100 | 104 | 100 | 110 | 121 | 145 | 168 | 200 | 169 | 154 | 158 | 148 | 137 | 134 | 130 | 127 | 125 |
| Alabama..... | 98 | 98 | 103 | 98 | 98 | 103 | 128 | 143 | 177 | 147 | 135 | 143 | 144 | 154 | 154 | 145 | 145 | 143 |
| Mississippi..... | 97 | 102 | 102 | 97 | 111 | 121 | 131 | 155 | 218 | 150 | 148 | 143 | 134 | 136 | 134 | 126 | 123 | 122 |
| West South Central: | | | | | | | | | | | | | | | | | | |
| Arkansas..... | 98 | 101 | 101 | 95 | 109 | 129 | 149 | 169 | 222 | 186 | 174 | 170 | 160 | 160 | 153 | 150 | 147 | 145 |
| Louisiana..... | 99 | 102 | 99 | 95 | 106 | 112 | 143 | 157 | 198 | 163 | 140 | 144 | 137 | 141 | 143 | 135 | 132 | 132 |
| Oklahoma..... | 98 | 101 | 101 | 95 | 104 | 114 | 130 | 140 | 166 | 160 | 139 | 133 | 125 | 131 | 130 | 128 | 127 | 127 |
| Texas..... | 95 | 100 | 105 | 103 | 103 | 115 | 133 | 141 | 174 | 156 | 133 | 128 | 137 | 146 | 146 | 141 | 139 | 138 |
| Mountain: | | | | | | | | | | | | | | | | | | |
| Montana..... | 97 | 100 | 103 | 100 | 94 | 100 | 106 | 114 | 126 | 105 | 96 | 87 | 81 | 75 | 72 | 70 | 71 | 72 |
| Idaho..... | 100 | 101 | 99 | 96 | 99 | 114 | 130 | 146 | 172 | 162 | 136 | 133 | 129 | 123 | 119 | 117 | 116 | 116 |
| Wyoming..... | 97 | 103 | 100 | 103 | 94 | 97 | 121 | 147 | 176 | 146 | 134 | 121 | 112 | 100 | 95 | 94 | 95 | 96 |
| Colorado..... | 98 | 103 | 98 | 93 | 102 | 107 | 110 | 118 | 141 | 132 | 123 | 113 | 98 | 92 | 89 | 82 | 82 | 82 |
| New Mexico..... | 100 | 104 | 96 | 100 | 96 | 111 | 118 | 127 | 144 | 125 | 115 | 110 | 110 | 108 | 106 | 108 | 108 | 109 |
| Arizona..... | 95 | 100 | 105 | 97 | 95 | 105 | 125 | 140 | 165 | 148 | 135 | 124 | 128 | 121 | 125 | 123 | 122 | 123 |
| Utah..... | 100 | 102 | 98 | 98 | 104 | 117 | 122 | 144 | 167 | 137 | 133 | 133 | 131 | 130 | 129 | 128 | 127 | 127 |
| Nevada..... | 96 | 100 | 103 | 102 | 99 | 96 | 103 | 117 | 135 | 123 | 119 | 112 | 108 | 102 | 99 | 99 | 99 | 99 |
| Pacific: | | | | | | | | | | | | | | | | | | |
| Washington..... | 98 | 100 | 103 | 100 | 102 | 112 | 118 | 122 | 140 | 132 | 124 | 117 | 115 | 113 | 112 | 111 | 110 | 110 |
| Oregon..... | 97 | 100 | 103 | 99 | 100 | 104 | 112 | 118 | 130 | 130 | 122 | 115 | 113 | 110 | 107 | 106 | 106 | 106 |
| California..... | 93 | 99 | 108 | 111 | 116 | 130 | 136 | 142 | 167 | 168 | 166 | 165 | 164 | 164 | 163 | 162 | 161 | 160 |

Bureau of Agricultural Economics. Based on values as reported by crop reporters. Values as reported by the census for 1910, 1920, and 1925 will be found in Table 511 of the 1927 Yearbook.

¹ All farm land with improvements, as of Mar. 1. Owing to rounding of figures, 1912-1914 will not always equal exactly 100 per cent.

NOTE.—A table similar to Table 511, 1927 Yearbook, census figures on value of farm lands and buildings, is omitted.

TABLE 541.—Number of farms per 1,000 changing ownership by various methods, by States and geographic divisions, 12 months ended March 15, 1926—1929

| Geographic division and State | Voluntary sales and trades ¹ | | | | | | | | | | Forced sales and related defaults | | | | | | | | | | Adminis- trators' and executors' sales ¹ | Miscellaneous and unclassified | | | | Total, all classes | | | | | | | | | | | | | | | | | | |
|----------------------------------|--|------|------|------|------|------|------|------|------|------|-----------------------------------|------|------|------|------|------|------|------|------|------|--|-----------------------------------|------|-----|-----|--------------------|-------|------|-------|------|-------------------------|------|--|--|-------|--|--|--|---------------------|--|--|--|--|--|
| | 1926 | | | | | 1927 | | | | | 1928 | | | | | 1929 | | | | | | 1930 | | | | | Total | | | | Inheritance and gift | | | | Total | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Delinquent taxes | | | | Foreclosure of mortgage, bank- ruptcy, etc. ² | |
| | 1926 | | | | | 1927 | | | | | 1928 | | | | | 1929 | | | | | | 1930 | | | | | 1926 | | | | 1927 | | | | 1928 | | | | 1929 | | | | 1930 | |
| United States..... | 29.6 | 28.3 | 26.3 | 23.5 | 4.2 | 5.1 | 5.2 | 4.7 | 17.4 | 18.2 | 17.6 | 14.7 | 21.6 | 23.3 | 22.8 | 19.4 | 8.0 | 8.8 | 8.9 | 8.5 | 7.0 | 6.7 | 5.4 | 2.2 | 1.1 | 1.3 | 1.1 | 61.4 | 68.5 | 66.0 | 57.9 | | | | | | | | | | | | | |
| New England..... | 34.0 | 32.4 | 34.9 | 30.4 | 4.5 | 3.8 | 3.0 | 3.6 | 9.3 | 8.6 | 7.7 | 7.3 | 13.8 | 12.4 | 10.7 | 10.9 | 8.4 | 9.9 | 10.4 | 9.6 | 7.5 | 7.1 | 6.5 | 1.9 | 0.7 | 1.0 | 0.8 | 58.1 | 62.9 | 64.1 | 53.2 | | | | | | | | | | | | | |
| Middle Atlantic..... | 35.4 | 37.0 | 37.3 | 28.2 | 4.1 | 3.7 | 3.0 | 3.4 | 8.9 | 8.8 | 8.4 | 8.4 | 13.8 | 11.8 | 10.7 | 12.0 | 8.5 | 9.8 | 9.7 | 8.9 | 9.1 | 8.3 | 6.7 | 2.0 | 1.4 | 1.2 | 1.3 | 55.2 | 67.8 | 68.4 | 54.6 | | | | | | | | | | | | | |
| East North Central..... | 25.8 | 25.9 | 24.0 | 21.0 | 3.2 | 3.8 | 4.2 | 3.3 | 15.7 | 16.6 | 16.5 | 15.8 | 18.9 | 20.4 | 20.7 | 19.1 | 8.5 | 9.8 | 9.7 | 8.9 | 9.1 | 8.3 | 6.7 | 2.5 | 1.5 | 1.8 | 1.2 | 55.0 | 66.5 | 63.9 | 57.0 | | | | | | | | | | | | | |
| West North Central..... | 23.0 | 23.4 | 23.9 | 22.4 | 4.3 | 5.3 | 5.1 | 3.6 | 26.5 | 26.4 | 27.3 | 21.9 | 30.8 | 32.0 | 32.4 | 25.5 | 8.0 | 8.1 | 8.4 | 8.5 | 6.5 | 6.1 | 2.5 | 1.4 | 1.2 | 1.3 | 55.2 | 66.5 | 63.9 | 57.0 | | | | | | | | | | | | | | |
| South Atlantic..... | 28.0 | 24.2 | 20.5 | 18.3 | 4.0 | 6.9 | 6.9 | 9.0 | 14.0 | 14.1 | 16.4 | 14.4 | 16.4 | 14.0 | 16.4 | 21.7 | 23.3 | 23.2 | 23.8 | 10.2 | 10.6 | 10.4 | 7.7 | 7.9 | 1.1 | 1.1 | 59.1 | 64.0 | 62.9 | 60.3 | | | | | | | | | | | | | | |
| East South Central..... | 33.5 | 29.3 | 27.5 | 23.4 | 4.0 | 5.8 | 5.4 | 4.0 | 12.4 | 13.9 | 14.6 | 11.2 | 16.4 | 21.7 | 20.0 | 15.2 | 8.1 | 9.3 | 9.2 | 8.8 | 7.5 | 6.6 | 5.4 | 1.8 | 0.8 | 1.1 | 0.9 | 59.8 | 68.6 | 64.4 | 53.7 | | | | | | | | | | | | | |
| West South Central..... | 34.7 | 31.1 | 27.9 | 25.5 | 3.4 | 3.8 | 4.1 | 3.2 | 15.3 | 15.3 | 14.4 | 12.0 | 18.7 | 19.9 | 18.5 | 15.2 | 6.0 | 5.8 | 5.6 | 6.0 | 4.4 | 3.7 | 4.1 | 3.5 | 2.3 | 1.9 | 1.4 | 90.7 | 91.5 | 85.4 | 76.2 | | | | | | | | | | | | | |
| Mountain..... | 32.0 | 33.7 | 34.8 | 35.6 | 9.8 | 9.5 | 12.0 | 10.8 | 40.4 | 33.3 | 27.4 | 18.3 | 50.2 | 45.3 | 39.4 | 29.1 | 5.0 | 5.8 | 5.6 | 6.0 | 4.4 | 3.7 | 4.1 | 3.5 | 2.3 | 1.9 | 1.4 | 90.7 | 91.5 | 85.4 | 76.2 | | | | | | | | | | | | | |
| Pacific..... | 35.6 | 36.3 | 34.3 | 28.3 | 3.9 | 4.5 | 4.2 | 3.9 | 16.7 | 15.6 | 15.7 | 13.6 | 20.6 | 20.1 | 19.9 | 17.5 | 6.2 | 6.9 | 7.1 | 6.5 | 4.0 | 4.4 | 3.7 | 3.3 | 1.4 | 1.4 | 1.5 | 65.7 | 68.7 | 67.1 | 57.5 | | | | | | | | | | | | | |
| New England: | 31.7 | 32.8 | 33.2 | 29.1 | 6.7 | 6.0 | 5.2 | 7.8 | 11.1 | 10.5 | 8.8 | 11.0 | 17.8 | 16.5 | 14.0 | 18.8 | 8.3 | 11.8 | 11.5 | 12.9 | 6.5 | 5.7 | 4.5 | 2.5 | 0.6 | 1.0 | 0.4 | 60.3 | 68.2 | 65.4 | 65.7 | | | | | | | | | | | | | |
| Maine..... | 34.4 | 33.5 | 37.8 | 29.7 | 7.1 | 5.0 | 5.1 | 2.5 | 6.9 | 8.8 | 8.8 | 8.8 | 13.0 | 12.8 | 14.1 | 8.1 | 7.4 | 8.4 | 7.9 | 7.3 | 6.0 | 5.0 | 5.7 | 1.9 | 0.4 | 0.5 | 0.5 | 56.3 | 62.1 | 65.3 | 50.3 | | | | | | | | | | | | | |
| New Hampshire..... | 46.0 | 42.0 | 40.6 | 33.7 | 1.3 | 1.0 | 1.2 | 0.9 | 11.9 | 10.8 | 8.8 | 8.8 | 12.2 | 12.5 | 13.8 | 7.9 | 8.8 | 10.4 | 10.9 | 8.5 | 8.0 | 20.2 | 20.0 | 4.0 | 1.4 | 0.3 | 0.9 | 1.4 | 69.9 | 76.3 | 73.2 | 64.5 | | | | | | | | | | | | |
| Vermont..... | 31.3 | 28.0 | 35.1 | 32.6 | 2.1 | 1.0 | 1.2 | 2.2 | 5.5 | 6.0 | 5.1 | 6.2 | 10.7 | 8.0 | 7.0 | 8.4 | 8.6 | 8.3 | 9.5 | 8.3 | 8.0 | 4.0 | 1.4 | 0.3 | 0.9 | 1.4 | 0.3 | 48.9 | 51.4 | 48.5 | 44.7 | | | | | | | | | | | | | |
| Massachusetts..... | 39.6 | 35.0 | 30.0 | 25.8 | 6.9 | 4.0 | 1.2 | 1.0 | 7.3 | 6.5 | 3.0 | 3.0 | 15.1 | 10.3 | 3.7 | 6.5 | 9.9 | 8.0 | 8.9 | 10.8 | 8.0 | 5.0 | 2.0 | 4.2 | 0.0 | 0.5 | 0.0 | 69.9 | 62.5 | 43.1 | 45.1 | | | | | | | | | | | | | |
| Rhode Island..... | 27.1 | 28.9 | 29.7 | 27.8 | 5.2 | 3.0 | 1.0 | 0.9 | 9.9 | 6.0 | 3.0 | 3.0 | 16.2 | 10.3 | 3.7 | 3.9 | 8.2 | 9.0 | 11.0 | 7.3 | 9.1 | 10.5 | 9.0 | 1.0 | 1.3 | 0.8 | 0.4 | 51.4 | 52.5 | 56.0 | 43.4 | | | | | | | | | | | | | |
| Connecticut..... | 34.7 | 37.5 | 35.6 | 31.6 | 4.1 | 3.9 | 5.2 | 5.2 | 10.8 | 12.7 | 12.2 | 12.0 | 14.9 | 16.6 | 17.4 | 17.2 | 8.7 | 10.4 | 9.2 | 8.1 | 8.0 | 7.5 | 5.9 | 2.7 | 1.9 | 1.9 | 1.5 | 59.7 | 74.3 | 71.6 | 62.8 | | | | | | | | | | | | | |
| New York..... | 58.4 | 54.4 | 44.4 | 30.6 | 2.8 | 3.4 | 4.0 | 2.0 | 7.8 | 6.0 | 6.9 | 4.0 | 10.6 | 9.4 | 10.9 | 6.0 | 7.5 | 7.0 | 7.2 | 6.2 | 8.3 | 5.0 | 0.6 | 4.0 | 0.9 | 0.8 | 0.8 | 73.1 | 73.0 | 72.7 | 63.8 | | | | | | | | | | | | | |
| Pennsylvania..... | 33.7 | 34.0 | 30.2 | 26.0 | 1.9 | 2.1 | 1.7 | 2.4 | 7.0 | 5.6 | 5.6 | 5.6 | 8.9 | 7.7 | 7.2 | 8.0 | 7.0 | 7.6 | 8.2 | 8.1 | 9.6 | 8.8 | 2.5 | 1.3 | 1.9 | 1.0 | 53.1 | 60.2 | 56.1 | 51.9 | | | | | | | | | | | | | | |
| East North Central: | 29.8 | 30.8 | 27.3 | 23.1 | 1.6 | 2.1 | 1.8 | 1.5 | 11.2 | 11.5 | 11.4 | 13.3 | 12.8 | 13.6 | 13.2 | 14.9 | 8.1 | 9.0 | 9.1 | 9.2 | 9.7 | 9.2 | 8.3 | 2.3 | 1.2 | 1.0 | 1.0 | 53.0 | 64.3 | 59.8 | 56.4 | | | | | | | | | | | | | |
| Ohio..... | 26.8 | 25.8 | 23.6 | 19.2 | 4.2 | 6.4 | 6.3 | 5.4 | 14.0 | 16.9 | 17.3 | 15.7 | 18.2 | 22.3 | 23.6 | 21.1 | 9.0 | 10.5 | 9.9 | 10.0 | 9.8 | 7.6 | 2.2 | 1.0 | 0.8 | 1.2 | 0.8 | 56.2 | 70.1 | 67.7 | 59.1 | | | | | | | | | | | | | |
| Indiana..... | 22.3 | 21.7 | 20.0 | 19.7 | 1.4 | 1.8 | 3.1 | 1.9 | 15.7 | 16.8 | 17.9 | 16.7 | 17.1 | 18.6 | 21.0 | 18.6 | 0.5 | 12.4 | 12.7 | 11.9 | 1.0 | 9.5 | 8.4 | 1.2 | 1.4 | 1.0 | 0.5 | 51.1 | 63.1 | 64.2 | 59.1 | | | | | | | | | | | | | |
| Illinois..... | 30.8 | 30.5 | 30.3 | 24.8 | 4.6 | 4.0 | 4.7 | 4.7 | 16.6 | 18.8 | 18.0 | 17.1 | 21.2 | 25.4 | 25.7 | 23.0 | 8.9 | 9.8 | 10.0 | 7.3 | 7.9 | 6.9 | 4.1 | 1.7 | 1.2 | 1.5 | 2.1 | 62.6 | 74.6 | 73.9 | 60.1 | | | | | | | | | | | | | |
| Michigan..... | 18.9 | 19.8 | 18.2 | 18.1 | 4.3 | 4.0 | 3.7 | 3.5 | 22.4 | 20.5 | 19.0 | 16.5 | 27.2 | 24.2 | 22.7 | 20.7 | 5.7 | 6.9 | 6.2 | 5.7 | 5.8 | 5.4 | 4.6 | 2.7 | 2.0 | 1.8 | 1.9 | 54.5 | 59.0 | 54.3 | 50.3 | | | | | | | | | | | | | |
| Wisconsin..... | 18.0 | 18.5 | 19.4 | 16.8 | 3.8 | 4.6 | 5.5 | 3.7 | 26.8 | 24.7 | 26.4 | 26.4 | 30.6 | 29.2 | 31.9 | 30.1 | 6.7 | 6.7 | 6.3 | 6.6 | 5.3 | 4.3 | 4.2 | 2.6 | 1.7 | 1.5 | 0.8 | 57.9 | 61.4 | 62.4 | 53.5 | | | | | | | | | | | | | |
| Minnesota..... | 13.5 | 18.9 | 17.2 | 17.4 | 2.6 | 2.5 | 2.3 | 2.0 | 26.9 | 27.3 | 28.1 | 25.2 | 29.5 | 29.8 | 30.4 | 27.2 | 7.7 | 8.5 | 8.6 | 8.6 | 7.0 | 7.6 | 7.1 | 2.0 | 1.2 | 1.4 | 1.3 | 54.7 | 63.2 | 65.2 | 61.6 | | | | | | | | | | | | | |
| Iowa..... | 28.9 | 28.7 | 27.7 | 26.7 | 2.4 | 2.4 | 2.3 | 2.0 | 29.4 | 27.7 | 24.1 | 21.7 | 23.5 | 26.7 | 27.0 | 25.2 | 9.4 | 9.5 | 9.6 | 10.1 | 6.6 | 6.8 | 5.7 | 3.1 | 1.1 | 1.8 | 1.0 | 66.2 | 73.8 | 73.7 | 68.7 | | | | | | | | | | | | | |
| Missouri..... | 22.9 | 23.9 | 23.6 | 26.6 | 12.7 | 18.1 | 16.5 | 10.7 | 46.3 | 43.0 | 39.4 | 27.0 | 59.0 | 61.1 | 55.9 | 37.1 | 6.7 | 6.5 | 8.0 | 8.6 | 5.1 | 5.2 | 3.5 | 2.2 | 1.0 | 0.8 | 1.8 | 91.8 | 97.6 | 96.5 | 80.2 | | | | | | | | | | | | | |
| North Dakota..... | 16.7 | 20.8 | 26.9 | 21.1 | 11.3 | 16.5 | 10.1 | 11.1 | 7.8 | 52.6 | 51.1 | 46.8 | 27.2 | 66.1 | 66.1 | 57.9 | 35.0 | 8.6 | 8.0 | 8.1 | 8.2 | 5.5 | 5.2 | 3.8 | 1.6 | 1.3 | 1.5 | 93.0 | 101.7 | 98.6 | 71.8 | | | | | | | | | | | | | |
| South Dakota..... | 16.7 | 20.8 | 26.9 | 21.1 | 11.3 | 16.5 | 10.1 | 11.1 | 7.8 | 52.6 | 51.1 | 46.8 | 27.2 | 66.1 | 66.1 | 57.9 | 35.0 | 8.6 | 8.0 | 8.1 | 8.2 | 5.5 | 5.2 | 3.8 | 1.6 | 1.3 | 1.5 | 93.0 | 101.7 | 98.6 | 71.8 | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|------|------|-------|-------|-------|-------|------|
| Nebraska..... | 23.4 | 26.2 | 26.4 | 26.5 | 24.9 | 15.7 | 24.1 | 28.5 | 28.3 | 17.6 | 7.3 | 8.0 | 8.4 | 8.6 | 7.8 | 9.2 | 8.1 | 2.6 | 1.4 | 2.0 | 1.6 | 57.4 | 71.9 | 74.3 | 62.4 | | | | | | | |
| Kansas..... | 23.7 | 26.6 | 27.3 | 24.1 | 1.5 | 13.8 | 10.0 | 13.0 | 18.9 | 13.9 | 23.0 | 14.5 | 8.3 | 8.1 | 9.1 | 8.3 | 7.2 | 6.5 | 6.8 | 2.5 | 1.2 | 0.5 | 59.3 | 63.0 | 57.1 | 54.5 | | | | | | |
| South Atlantic: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Delaware..... | 22.7 | 30.9 | 17.9 | 24.4 | 5.5 | 10.3 | 10.0 | 8.0 | 9.9 | 12.8 | 12.5 | 10.7 | 11.4 | 11.7 | 10.2 | 9.7 | 5.4 | 0.0 | 0.5 | 0.9 | 0.2 | 43.0 | 33.4 | 48.1 | 30.6 | | | | | | | |
| Maryland..... | 22.3 | 30.0 | 28.5 | 23.6 | 4.7 | 5.0 | 2.0 | 1.5 | 9.5 | 12.2 | 11.2 | 17.2 | 10.0 | 18.7 | 7.8 | 9.4 | 8.1 | 9.3 | 10.0 | 1.4 | 0.6 | 0.8 | 53.7 | 66.4 | 62.6 | 63.8 | | | | | | |
| District of Columbia..... | 23.2 | 19.3 | 17.3 | 16.3 | 3.2 | 2.5 | 2.6 | 3.5 | 13.8 | 12.6 | 17.0 | 14.3 | 14.6 | 14.1 | 10.6 | 10.2 | 11.0 | 9.1 | 6.8 | 7.2 | 0.3 | 0.9 | 52.8 | 50.9 | 51.1 | 46.6 | | | | | | |
| Virginia..... | 30.1 | 24.2 | 22.5 | 19.1 | 7.0 | 0.4 | 10.0 | 10.0 | 8.4 | 17.6 | 15.6 | 15.4 | 17.2 | 17.8 | 16.0 | 13.8 | 13.0 | 10.1 | 5.6 | 2.2 | 1.6 | 1.1 | 0.9 | 53.2 | 67.6 | 59.4 | 54.5 | | | | | |
| West Virginia..... | 25.0 | 24.3 | 10.1 | 19.2 | 5.9 | 8.0 | 8.4 | 13.7 | 8.7 | 14.0 | 14.0 | 15.0 | 14.4 | 20.1 | 22.4 | 26.7 | 30.7 | 36.2 | 33.9 | 10.4 | 8.1 | 5.9 | 9.0 | 7.0 | 9.2 | 0.8 | 57.4 | 60.8 | 72.0 | 67.1 | | |
| North Carolina..... | 18.0 | 14.0 | 14.1 | 14.4 | 5.2 | 8.1 | 8.6 | 11.7 | 21.5 | 22.3 | 26.7 | 28.9 | 28.7 | 28.9 | 27.9 | 29.9 | 23.1 | 11.0 | 10.7 | 11.5 | 9.9 | 9.0 | 0.9 | 1.5 | 1.2 | 0.7 | 72.4 | 74.3 | 63.4 | | | |
| South Carolina..... | 25.3 | 24.0 | 21.3 | 17.6 | 6.6 | 3.2 | 6.0 | 7.7 | 22.3 | 19.7 | 23.7 | 17.4 | 28.9 | 27.9 | 20.7 | 25.1 | 11.0 | 10.7 | 11.5 | 9.9 | 9.0 | 0.9 | 1.5 | 1.2 | 0.7 | 72.4 | 74.3 | 63.4 | | | | |
| Georgia..... | 31.0 | 63.5 | 31.7 | 22.4 | 7.2 | 6.5 | 11.7 | 8.6 | 8.9 | 8.5 | 12.4 | 6.0 | 16.1 | 15.1 | 24.1 | 14.6 | 4.6 | 4.3 | 3.2 | 7.2 | 0.0 | 0.5 | 0.0 | 310.7 | 386.4 | 62.7 | 47.0 | | | | | |
| Florida..... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| East South Central: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kentucky..... | 35.3 | 31.0 | 30.5 | 25.7 | 5.0 | 7.5 | 8.0 | 4.5 | 12.2 | 16.1 | 16.1 | 11.6 | 17.2 | 23.6 | 24.1 | 16.1 | 8.4 | 9.3 | 9.5 | 10.5 | 8.0 | 7.7 | 5.5 | 21 | 1.0 | 1.2 | 1.5 | 63.0 | 72.9 | 73.0 | 59.3 | |
| Tennessee..... | 29.1 | 25.3 | 21.3 | 15.0 | 2.7 | 4.5 | 3.5 | 7.2 | 13.3 | 13.3 | 13.6 | 9.6 | 16.0 | 19.2 | 17.4 | 11.9 | 8.9 | 9.4 | 9.2 | 7.7 | 7.7 | 6.5 | 1.9 | 0.8 | 1.1 | 0.6 | 55.9 | 63.0 | 56.0 | 45.6 | | |
| Alabama..... | 33.5 | 30.3 | 27.8 | 23.1 | 1.8 | 1.3 | 1.5 | 7.2 | 11.2 | 14.2 | 12.8 | 9.7 | 13.0 | 13.7 | 14.3 | 10.9 | 7.1 | 9.2 | 9.0 | 7.7 | 6.6 | 5.9 | 3.8 | 1.0 | 0.3 | 1.0 | 0.6 | 56.6 | 62.1 | 58.0 | 44.6 | |
| Mississippi..... | 34.6 | 30.9 | 31.2 | 26.2 | 7.1 | 10.4 | 8.3 | 6.9 | 12.9 | 18.7 | 13.9 | 14.4 | 20.0 | 28.1 | 24.2 | 23.3 | 8.0 | 9.3 | 8.9 | 9.3 | 7.4 | 5.0 | 5.5 | 2.2 | 0.9 | 1.0 | 1.0 | 64.8 | 77.6 | 70.3 | 65.3 | |
| West South Central: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arkansas..... | 42.6 | 38.2 | 34.1 | 25.4 | 2.9 | 3.0 | 5.8 | 4.8 | 17.8 | 19.9 | 15.1 | 16.0 | 20.7 | 22.9 | 20.9 | 20.8 | 8.1 | 7.4 | 8.3 | 7.7 | 3.5 | 3.6 | 3.8 | 1.7 | 0.6 | 1.4 | 1.2 | 73.1 | 72.6 | 68.3 | 53.9 | |
| Oklahoma..... | 31.6 | 28.4 | 29.0 | 25.0 | 5.6 | 8.5 | 3.6 | 6.0 | 17.5 | 16.1 | 18.4 | 14.0 | 22.5 | 20.9 | 23.7 | 20.0 | 9.5 | 9.1 | 10.5 | 11.4 | 9.0 | 8.8 | 5.9 | 2.2 | 0.9 | 1.5 | 1.0 | 66.1 | 69.3 | 73.5 | 67.8 | |
| Louisiana..... | 33.7 | 29.0 | 26.0 | 23.2 | 3.2 | 2.4 | 2.1 | 2.4 | 21.8 | 14.3 | 14.3 | 14.3 | 20.7 | 32.4 | 29.0 | 17.5 | 4.5 | 5.5 | 4.9 | 4.7 | 4.1 | 4.9 | 3.0 | 2.2 | 0.9 | 1.3 | 1.4 | 71.8 | 71.9 | 65.1 | 51.6 | |
| Oklahoma..... | 32.4 | 28.4 | 26.3 | 24.8 | 1.6 | 1.5 | 1.4 | 1.8 | 9.3 | 10.5 | 9.5 | 8.5 | 10.9 | 12.3 | 10.9 | 10.3 | 6.5 | 8.7 | 8.3 | 7.1 | 3.8 | 3.0 | 3.3 | 2.0 | 0.6 | 1.0 | 0.8 | 51.8 | 54.8 | 49.5 | 46.3 | |
| Texas..... | 30.1 | 35.2 | 45.5 | 49.8 | 10.1 | 13.0 | 15.5 | 18.1 | 60.8 | 58.0 | 40.9 | 21.1 | 70.9 | 69.0 | 56.4 | 39.2 | 4.7 | 5.7 | 5.7 | 5.7 | 5.2 | 5.0 | 5.5 | 2.8 | 2.5 | 2.0 | 2.0 | 618.5 | 517.6 | 514.0 | 104.1 | |
| Mountain: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Montana..... | 27.7 | 26.5 | 34.5 | 29.0 | 7.8 | 8.1 | 14.5 | 10.7 | 39.6 | 32.6 | 29.5 | 20.9 | 47.4 | 40.7 | 43.0 | 31.6 | 5.6 | 5.1 | 7.0 | 5.8 | 3.2 | 4.9 | 4.0 | 2.6 | 2.3 | 2.3 | 0.7 | 33.3 | 77.8 | 91.7 | 71.1 | |
| Idaho..... | 30.1 | 35.2 | 34.5 | 29.0 | 7.8 | 8.1 | 14.5 | 10.7 | 39.6 | 32.6 | 29.5 | 20.9 | 47.4 | 40.7 | 43.0 | 31.6 | 5.6 | 5.1 | 7.0 | 5.8 | 3.2 | 4.9 | 4.0 | 2.6 | 2.3 | 2.3 | 0.7 | 33.3 | 77.8 | 91.7 | 71.1 | |
| Wyoming..... | 27.2 | 32.2 | 38.4 | 34.3 | 3.4 | 3.3 | 7.2 | 12.9 | 27.9 | 23.6 | 19.3 | 17.8 | 42.4 | 39.3 | 32.3 | 26.8 | 3.2 | 6.0 | 6.1 | 6.3 | 4.3 | 3.5 | 3.5 | 3.4 | 3.0 | 1.8 | 1.4 | 17.2 | 84.8 | 82.0 | 72.3 | |
| Colorado..... | 33.9 | 35.1 | 30.0 | 37.6 | 13.2 | 10.2 | 12.0 | 12.0 | 27.9 | 23.6 | 19.3 | 17.8 | 42.4 | 39.3 | 32.3 | 26.8 | 3.2 | 6.0 | 6.1 | 6.3 | 4.3 | 3.5 | 3.5 | 3.4 | 3.0 | 1.8 | 1.4 | 17.2 | 84.8 | 82.0 | 72.3 | |
| New Mexico..... | 40.2 | 50.1 | 35.9 | 35.9 | 4.1 | 5.4 | 5.4 | 6.0 | 33.2 | 30.3 | 20.6 | 12.4 | 37.5 | 33.5 | 26.0 | 13.4 | 4.6 | 5.6 | 4.6 | 4.6 | 3.9 | 2.9 | 2.2 | 0.6 | 3.4 | 3.9 | 2.2 | 0.7 | 98.9 | 99.2 | 71.6 | 61.9 |
| Arizona..... | 26.0 | 30.0 | 30.3 | 34.4 | 5.5 | 5.5 | 5.1 | 8.0 | 33.2 | 30.3 | 20.6 | 12.4 | 37.5 | 33.5 | 26.0 | 13.4 | 4.6 | 5.6 | 4.6 | 4.6 | 3.9 | 2.9 | 2.2 | 0.6 | 3.4 | 3.9 | 2.2 | 0.7 | 98.9 | 99.2 | 71.6 | 61.9 |
| New Mexico..... | 26.0 | 30.0 | 30.3 | 34.4 | 5.5 | 5.5 | 5.1 | 8.0 | 33.2 | 30.3 | 20.6 | 12.4 | 37.5 | 33.5 | 26.0 | 13.4 | 4.6 | 5.6 | 4.6 | 4.6 | 3.9 | 2.9 | 2.2 | 0.6 | 3.4 | 3.9 | 2.2 | 0.7 | 98.9 | 99.2 | 71.6 | 61.9 |
| Utah..... | 23.0 | 22.0 | 23.0 | 18.2 | 10.9 | 9.5 | 13.9 | 7.0 | 12.5 | 10.0 | 13.8 | 9.5 | 53.9 | 43.5 | 27.7 | 16.5 | 4.9 | 5.0 | 4.5 | 4.4 | 4.1 | 3.1 | 4.1 | 1.1 | 1.1 | 1.4 | 0.8 | 52.4 | 58.0 | 59.1 | 43.5 | |
| Nevada..... | 20.8 | 23.8 | 21.7 | 25.7 | 0.0 | 2.0 | 1.4 | 1.0 | 30.9 | 24.6 | 18.3 | 9.8 | 30.9 | 25.6 | 19.7 | 10.8 | 4.1 | 3.5 | 5.0 | 5.0 | 3.0 | 4.0 | 3.0 | 3.7 | 1.0 | 1.7 | 2.0 | 59.5 | 57.9 | 52.3 | 46.5 | |
| Pacific: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Washington..... | 34.8 | 35.7 | 35.5 | 29.7 | 7.5 | 8.7 | 8.0 | 5.3 | 21.0 | 20.3 | 15.3 | 13.9 | 28.5 | 29.0 | 23.3 | 19.2 | 6.4 | 7.4 | 7.0 | 5.9 | 4.2 | 3.8 | 3.3 | 2.5 | 1.5 | 1.6 | 2.1 | 72.2 | 77.8 | 71.2 | 60.2 | |
| Oregon..... | 24.7 | 34.1 | 37.4 | 31.0 | 3.0 | 5.5 | 5.2 | 6.0 | 5.2 | 17.2 | 16.0 | 17.9 | 10.0 | 20.7 | 21.2 | 23.9 | 15.2 | 6.5 | 7.9 | 7.4 | 5.6 | 5.6 | 3.4 | 3.0 | 1.3 | 1.8 | 0.8 | 59.9 | 60.1 | 76.1 | 58.7 | |
| California..... | 38.5 | 37.5 | 32.3 | 26.4 | 2.1 | 2.0 | 1.5 | 2.7 | 14.2 | 13.0 | 15.0 | 16.3 | 15.0 | 16.3 | 15.0 | 16.3 | 15.0 | 16.3 | 15.0 | 16.3 | 15.0 | 16.3 | 15.0 | 16.3 | 15.0 | 16.3 | 15.0 | 16.3 | 15.0 | 16.3 | 15.0 | 16.3 |

Bureau of Agricultural Economics. Based upon returns from crop reporters. Revised figures. Supersedes Table 537, 1928 Yearbook.

1 Including contracts to purchase (but not options).

2 Including loss of title by default of contract, sales to avoid foreclosure, and surrender of title or other transfers to avoid foreclosure.

3 Including all other sales in settlement of estates.

4 Excluding administrators' and executors' sales in 1926.

TABLE 542.—*Bankruptcies among farmers and per cent the farmer cases are of all bankruptcies, years ended June 30, 1925-1929*

| Geographic division and State | 1925 | | | 1926 | | | 1927 | | | 1928 | | | 1929 | | |
|-------------------------------|--------|---------|-----------------------|--------|---------|-----------------------|--------|---------|-----------------------|--------|---------|-----------------------|--------|---------|-----------------------|
| | Total | Farmers | | Total | Farmers | | Total | Farmers | | Total | Farmers | | Total | Farmers | |
| | | Number | Per cent of all cases | | Number | Per cent of all cases | | Number | Per cent of all cases | | Number | Per cent of all cases | | Number | Per cent of all cases |
| United States..... | 14,236 | 7,872 | 17.8 | 47,049 | 7,769 | 16.5 | 48,066 | 6,296 | 13.1 | 53,444 | 5,679 | 10.6 | 56,897 | 4,939 | 8.7 |
| New England..... | 3,272 | 169 | 5.2 | 3,165 | 145 | 4.6 | 3,412 | 105 | 3.1 | 4,606 | 162 | 3.5 | 4,577 | 145 | 3.2 |
| Maine..... | 871 | 103 | 11.8 | 853 | 101 | 11.8 | 810 | 51 | 6.3 | 837 | 77 | 9.2 | 832 | 69 | 8.3 |
| New Hampshire..... | 80 | 5 | 5.8 | 108 | 7 | 6.5 | 105 | 7 | 6.7 | 110 | 7 | 6.4 | 135 | 6 | 4.4 |
| Vermont..... | 205 | 39 | 19.0 | 197 | 17 | 8.6 | 125 | 21 | 16.8 | 195 | 29 | 14.9 | 211 | 28 | 13.3 |
| Massachusetts..... | 1,378 | 7 | .5 | 1,438 | 12 | .8 | 1,646 | 10 | .6 | 2,408 | 18 | .7 | 2,550 | 26 | 1.0 |
| Rhode Island..... | 132 | 2 | 1.5 | 111 | 0 | .0 | 195 | 2 | 1.0 | 208 | 0 | .0 | 179 | 2 | 1.1 |
| Connecticut..... | 600 | 13 | 2.2 | 458 | 8 | 1.7 | 531 | 14 | 2.6 | 848 | 31 | 3.7 | 670 | 14 | 2.1 |
| Middle Atlantic..... | 7,348 | 190 | 2.6 | 6,508 | 224 | 3.4 | 7,189 | 224 | 3.1 | 7,878 | 274 | 3.5 | 8,382 | 270 | 3.2 |
| New York..... | 5,376 | 104 | 1.9 | 4,410 | 122 | 2.8 | 4,758 | 145 | 3.0 | 5,548 | 152 | 2.7 | 5,484 | 149 | 2.7 |
| New Jersey..... | 719 | 16 | 2.2 | 802 | 33 | 4.1 | 846 | 16 | 1.9 | 676 | 12 | 2.1 | 1,041 | 18 | 1.7 |
| Pennsylvania..... | 1,253 | 70 | 5.6 | 1,296 | 69 | 5.3 | 1,585 | 63 | 4.0 | 1,754 | 110 | 6.3 | 1,857 | 103 | 5.5 |
| East North Central..... | 5,692 | 760 | 13.4 | 7,470 | 844 | 11.3 | 7,842 | 719 | 9.2 | 9,354 | 874 | 9.3 | 11,122 | 980 | 8.8 |
| Ohio..... | 1,813 | 214 | 11.8 | 2,171 | 188 | 8.7 | 2,396 | 137 | 5.7 | 2,802 | 157 | 5.6 | 3,414 | 220 | 6.4 |
| Indiana..... | 360 | 97 | 26.9 | 471 | 112 | 23.8 | 413 | 76 | 18.4 | 547 | 114 | 20.9 | 691 | 110 | 15.9 |
| Illinois..... | 1,595 | 190 | 11.9 | 2,590 | 234 | 9.0 | 2,943 | 257 | 8.7 | 3,143 | 374 | 11.9 | 3,778 | 410 | 10.9 |
| Michigan..... | 868 | 46 | 5.3 | 930 | 50 | 5.4 | 818 | 34 | 4.2 | 1,192 | 41 | 3.4 | 1,536 | 36 | 2.3 |
| Wisconsin..... | 1,055 | 213 | 20.2 | 1,308 | 260 | 19.9 | 1,272 | 215 | 16.9 | 1,670 | 188 | 11.3 | 1,703 | 204 | 12.0 |
| West North Central..... | 7,363 | 2,889 | 39.2 | 7,953 | 2,813 | 35.4 | 7,944 | 2,404 | 30.3 | 7,149 | 1,729 | 24.2 | 6,942 | 1,471 | 21.2 |
| Minnesota..... | 1,586 | 369 | 23.3 | 1,962 | 419 | 21.4 | 1,840 | 294 | 16.0 | 2,104 | 266 | 12.6 | 2,010 | 193 | 9.6 |
| Iowa..... | 1,707 | 861 | 50.4 | 1,759 | 791 | 45.0 | 1,593 | 656 | 41.2 | 1,297 | 534 | 41.2 | 1,109 | 420 | 37.9 |
| Missouri..... | 1,482 | 287 | 19.4 | 1,530 | 301 | 19.7 | 1,614 | 314 | 19.5 | 1,741 | 288 | 16.5 | 1,771 | 211 | 11.9 |
| North Dakota..... | 837 | 629 | 75.1 | 773 | 536 | 69.3 | 567 | 376 | 66.3 | 258 | 153 | 59.3 | 452 | 287 | 63.5 |
| South Dakota..... | 556 | 352 | 63.3 | 623 | 368 | 59.1 | 626 | 352 | 56.2 | 478 | 239 | 50.0 | 250 | 106 | 42.4 |
| Nebraska..... | 523 | 178 | 33.9 | 628 | 238 | 36.2 | 689 | 181 | 26.3 | 578 | 135 | 23.4 | 684 | 157 | 23.0 |
| Kansas..... | 670 | 213 | 31.8 | 648 | 160 | 24.7 | 1,015 | 231 | 22.8 | 693 | 114 | 16.5 | 666 | 97 | 14.6 |
| South Atlantic..... | 5,894 | 1,037 | 17.6 | 5,889 | 747 | 12.7 | 5,874 | 585 | 10.0 | 6,895 | 685 | 9.9 | 7,254 | 510 | 7.0 |
| Delaware..... | 40 | 8 | 20.0 | 44 | 5 | 11.4 | 30 | 4 | 13.3 | 35 | 10 | 28.6 | 32 | 8 | 25.0 |
| Maryland..... | 175 | 38 | 21.7 | 315 | 54 | 17.1 | 267 | 35 | 13.1 | 317 | 49 | 15.5 | 375 | 48 | 12.8 |
| District of Columbia..... | 83 | 0 | .0 | 112 | 0 | .0 | 131 | 0 | .0 | 147 | 1 | .7 | 169 | — | — |
| Virginia..... | 1,407 | 95 | 6.8 | 1,089 | 111 | 6.6 | 1,844 | 97 | 5.3 | 1,976 | 109 | 5.5 | 2,193 | 98 | 4.5 |
| West Virginia..... | 414 | 19 | 4.6 | 482 | 10 | 2.1 | 657 | 16 | 2.4 | 794 | 25 | 3.1 | 976 | 41 | 4.2 |
| North Carolina..... | 308 | 45 | 14.6 | 319 | 37 | 11.6 | 389 | 50 | 12.9 | 377 | 38 | 10.1 | 317 | 25 | 7.9 |
| South Carolina..... | 230 | 26 | 11.3 | 275 | 53 | 19.3 | 280 | 47 | 16.8 | 289 | 46 | 15.9 | 239 | 34 | 14.2 |
| Georgia..... | 3,041 | 798 | 26.2 | 2,502 | 467 | 18.7 | 1,973 | 327 | 16.6 | 2,580 | 394 | 16.6 | 2,319 | 248 | 10.7 |
| Florida..... | 186 | 8 | 4.3 | 151 | 10 | 6.6 | 303 | 9 | 3.0 | 580 | 13 | 2.2 | 634 | 13 | 2.1 |
| East South Central..... | 5,316 | 517 | 9.7 | 6,119 | 579 | 9.5 | 6,364 | 615 | 9.7 | 7,562 | 521 | 6.9 | 7,825 | 352 | 4.5 |
| Kentucky..... | 682 | 108 | 15.8 | 1,027 | 117 | 11.4 | 1,209 | 164 | 13.6 | 1,748 | 191 | 10.9 | 1,800 | 131 | 7.0 |
| Tennessee..... | 1,844 | 109 | 5.9 | 2,052 | 134 | 6.5 | 2,132 | 101 | 4.7 | 2,376 | 102 | 4.3 | 2,964 | 118 | 4.0 |
| Alabama..... | 2,248 | 242 | 10.8 | 2,670 | 295 | 11.0 | 2,600 | 318 | 12.2 | 2,622 | 211 | 8.0 | 2,637 | 85 | 3.2 |
| Mississippi..... | 542 | 58 | 10.7 | 370 | 33 | 8.9 | 423 | 32 | 7.6 | 816 | 17 | 2.1 | 364 | 18 | 4.9 |
| West South Central..... | 2,750 | 650 | 23.6 | 2,979 | 764 | 25.6 | 2,741 | 567 | 20.7 | 2,870 | 561 | 19.5 | 2,805 | 484 | 17.3 |
| Arkansas..... | 338 | 85 | 25.1 | 448 | 101 | 22.5 | 416 | 94 | 22.6 | 379 | 89 | 23.5 | 484 | 83 | 17.1 |
| Louisiana..... | 362 | 77 | 21.3 | 473 | 159 | 33.6 | 471 | 119 | 25.3 | 481 | 98 | 20.3 | 531 | 85 | 16.0 |
| Oklahoma..... | 1,121 | 145 | 13.0 | 844 | 170 | 20.1 | 782 | 145 | 18.5 | 820 | 108 | 13.2 | 740 | 65 | 8.8 |
| Texas..... | 1,29 | 343 | 30.4 | 1,214 | 334 | 27.5 | 1,072 | 209 | 19.5 | 1,190 | 271 | 22.8 | 1,050 | 261 | 23.9 |
| Mountain..... | 2,563 | 1,071 | 41.8 | 2,677 | 1,142 | 42.7 | 1,915 | 609 | 31.8 | 1,747 | 420 | 24.0 | 1,601 | 335 | 20.9 |
| Montana..... | 703 | 490 | 69.6 | 1,052 | 624 | 59.3 | 536 | 245 | 45.7 | 346 | 126 | 36.4 | 379 | 131 | 34.6 |
| Idaho..... | 408 | 260 | 63.6 | 433 | 223 | 51.5 | 337 | 161 | 47.8 | 284 | 101 | 35.6 | 260 | 78 | 30.0 |
| Wyoming..... | 143 | 48 | 33.6 | 117 | 38 | 32.5 | 114 | 31 | 27.2 | 148 | 44 | 29.7 | 68 | 17 | 25.0 |
| Colorado..... | 686 | 220 | 32.1 | 479 | 143 | 29.9 | 400 | 90 | 22.5 | 387 | 63 | 16.3 | 426 | 50 | 11.7 |
| New Mexico..... | 95 | 27 | 28.4 | 141 | 50 | 35.5 | 87 | 22 | 25.3 | 98 | 27 | 27.6 | 84 | 26 | 31.0 |
| Arizona..... | 62 | 19 | 30.6 | 84 | 29 | 34.5 | 114 | 30 | 26.3 | 86 | 23 | 26.7 | 63 | 7 | 11.1 |
| Utah..... | 382 | 32 | 8.4 | 358 | 33 | 9.2 | 325 | 26 | 8.0 | 380 | 34 | 8.9 | 297 | 25 | 8.4 |
| Nevada..... | 24 | 5 | 20.8 | 13 | 2 | 15.4 | 22 | 4 | 18.2 | 18 | 2 | 11.1 | 24 | 1 | 4.2 |
| Pacific..... | 4,048 | 580 | 14.6 | 4,289 | 511 | 11.9 | 4,785 | 468 | 10.0 | 5,323 | 453 | 8.5 | 6,389 | 387 | 6.1 |
| Washington..... | 824 | 190 | 23.8 | 951 | 182 | 19.1 | 1,097 | 160 | 14.6 | 1,143 | 144 | 12.6 | 1,451 | 107 | 7.4 |
| Oregon..... | 628 | 100 | 16.8 | 1,085 | 109 | 10.0 | 1,044 | 72 | 6.9 | 1,213 | 67 | 5.5 | 1,277 | 83 | 6.5 |
| California..... | 2,296 | 293 | 12.8 | 2,253 | 220 | 9.8 | 2,644 | 236 | 8.9 | 2,967 | 242 | 8.2 | 3,661 | 197 | 5.4 |

Bureau of Agricultural Economics. Compiled from annual reports of the Attorney General.

TABLE 543.—*Bankruptcies among farmers, by geographic divisions, for fiscal years 1910-1929*

[Year ending June 30]

| Year | United States | | New England | | Middle Atlantic | | East North Central | | West North Central | |
|-----------|---------------|--------------------------------|-------------|--------------------------------|-----------------|--------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|
| | Number | Per cent of total bankruptcies | Number | Per cent of total bankruptcies | Number | Per cent of total bankruptcies | Number | Per cent of total bankruptcies | Number | Per cent of total bankruptcies |
| 1910..... | 849 | 5.7 | 123 | 6.0 | 52 | 1.8 | 98 | 3.2 | 287 | 15.9 |
| 1911..... | 679 | 4.8 | 85 | 4.4 | 48 | 1.6 | 89 | 3.4 | 167 | 11.0 |
| 1912..... | 837 | 5.4 | 148 | 7.4 | 58 | 1.7 | 78 | 2.7 | 219 | 14.2 |
| 1913..... | 942 | 5.4 | 81 | 4.0 | 66 | 1.8 | 143 | 5.0 | 258 | 13.7 |
| 1914..... | 1,045 | 5.6 | 88 | 4.0 | 63 | 2.0 | 91 | 2.8 | 289 | 14.6 |
| 1915..... | 1,246 | 5.9 | 112 | 4.8 | 90 | 2.4 | 94 | 2.8 | 290 | 13.8 |
| 1916..... | 1,658 | 6.9 | 143 | 5.3 | 88 | 2.0 | 146 | 3.9 | 276 | 12.6 |
| 1917..... | 1,906 | 7.5 | 152 | 4.8 | 130 | 2.7 | 142 | 3.6 | 325 | 13.6 |
| 1918..... | 1,632 | 7.0 | 125 | 4.3 | 97 | 2.4 | 126 | 3.6 | 267 | 11.4 |
| 1919..... | 1,207 | 6.3 | 104 | 4.1 | 89 | 2.4 | 75 | 2.2 | 156 | 8.1 |
| 1920..... | 997 | 6.4 | 72 | 3.8 | 67 | 2.2 | 83 | 3.3 | 213 | 12.0 |
| 1921..... | 1,363 | 9.0 | 91 | 6.2 | 91 | 3.3 | 62 | 3.6 | 324 | 20.6 |
| 1922..... | 3,236 | 14.4 | 92 | 4.9 | 77 | 2.6 | 247 | 9.0 | 1,066 | 40.3 |
| 1923..... | 5,940 | 17.4 | 146 | 4.9 | 148 | 3.1 | 569 | 11.5 | 2,005 | 46.1 |
| 1924..... | 7,772 | 18.7 | 196 | 5.8 | 171 | 3.2 | 684 | 12.2 | 2,785 | 42.5 |
| 1925..... | 7,872 | 17.8 | 169 | 5.2 | 190 | 2.6 | 760 | 13.4 | 2,889 | 30.2 |
| 1926..... | 7,769 | 16.5 | 145 | 4.6 | 224 | 3.4 | 844 | 11.3 | 2,813 | 35.4 |
| 1927..... | 6,296 | 13.1 | 105 | 3.1 | 224 | 3.1 | 719 | 9.2 | 2,404 | 30.3 |
| 1928..... | 5,679 | 10.6 | 162 | 3.5 | 274 | 3.5 | 874 | 9.3 | 1,729 | 24.2 |
| 1929..... | 4,939 | 8.7 | 145 | 3.2 | 270 | 3.2 | 980 | 8.8 | 1,471 | 21.2 |

| Year | South Atlantic | | East South Central | | West South Central | | Mountain | | Pacific | |
|-----------|----------------|--------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|----------|--------------------------------|---------|--------------------------------|
| | Number | Per cent of total bankruptcies | Number | Per cent of total bankruptcies | Number | Per cent of total bankruptcies | Number | Per cent of total bankruptcies | Number | Per cent of total bankruptcies |
| 1910..... | 63 | 4.5 | 38 | 2.8 | 66 | 8.3 | 35 | 7.1 | 87 | 9.0 |
| 1911..... | 78 | 5.1 | 65 | 5.3 | 72 | 8.2 | 35 | 7.0 | 40 | 4.2 |
| 1912..... | 79 | 4.7 | 91 | 5.7 | 62 | 7.0 | 55 | 9.1 | 47 | 4.6 |
| 1913..... | 85 | 4.5 | 83 | 4.1 | 89 | 7.4 | 66 | 8.9 | 71 | 5.4 |
| 1914..... | 100 | 4.5 | 100 | 4.2 | 81 | 6.8 | 118 | 15.7 | 115 | 6.9 |
| 1915..... | 177 | 5.5 | 127 | 4.4 | 97 | 9.3 | 159 | 19.2 | 100 | 5.9 |
| 1916..... | 369 | 9.8 | 164 | 6.8 | 178 | 9.4 | 179 | 17.0 | 115 | 6.1 |
| 1917..... | 407 | 12.2 | 184 | 6.8 | 217 | 12.2 | 193 | 17.4 | 156 | 7.3 |
| 1918..... | 410 | 13.8 | 179 | 5.3 | 186 | 15.1 | 105 | 11.4 | 137 | 6.7 |
| 1919..... | 291 | 15.8 | 126 | 5.6 | 164 | 14.9 | 102 | 11.9 | 100 | 5.8 |
| 1920..... | 169 | 10.1 | 108 | 6.8 | 95 | 10.0 | 104 | 16.2 | 86 | 5.9 |
| 1921..... | 297 | 13.7 | 100 | 3.9 | 124 | 15.7 | 177 | 23.8 | 97 | 7.2 |
| 1922..... | 678 | 17.0 | 201 | 4.9 | 264 | 19.5 | 419 | 38.2 | 192 | 11.0 |
| 1923..... | 959 | 17.0 | 420 | 9.1 | 539 | 20.4 | 730 | 43.3 | 424 | 16.3 |
| 1924..... | 1,085 | 16.9 | 483 | 9.7 | 788 | 22.3 | 1,040 | 46.3 | 540 | 15.7 |
| 1925..... | 1,037 | 17.6 | 517 | 9.7 | 650 | 23.6 | 1,071 | 41.8 | 589 | 14.6 |
| 1926..... | 747 | 12.7 | 579 | 9.5 | 764 | 25.6 | 1,142 | 42.7 | 511 | 11.9 |
| 1927..... | 585 | 10.0 | 615 | 9.7 | 567 | 20.7 | 609 | 31.8 | 468 | 10.0 |
| 1928..... | 685 | 9.9 | 521 | 6.9 | 561 | 19.5 | 420 | 24.0 | 453 | 8.5 |
| 1929..... | 510 | 7.0 | 352 | 4.5 | 484 | 17.3 | 335 | 20.9 | 387 | 6.1 |

TABLE 544.—*Farm tenancy by States: Relative importance of tenant farming compared with all farming, percentages based on census data, 1880-1925*

| Geographic division and State | Percentage of all farms operated by tenants, 1880-1925 ¹ | | | | | Percentage of farms of designated size operated by tenants, 1925 ¹ | | | | | Percentage of farm land rented, 1900-1925 ¹ | | | | Land operated by tenants, 1925 ¹ | | | | Crop production on tenant farms, 1924 ¹ | | | | | | Livestock on tenant farms, Jan. 1, 1925 ¹ | | | |
|-------------------------------|---|------|------|------|------|---|----------------|-------------|---------------|--------------------|--|------|-------------------|------|---|-------------------------|-----------------------------|-------|--|-------|------|------|--------|---------|--|-------------|--------------|------|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1880 | 1890 | 1900 | 1910 | 1920 | 1925 | Under 50 acres | 50-99 acres | 100-499 acres | 500 acres and over | 1900 | 1910 | 1920 ² | 1925 | All land in farms | Land in harvested crops | Land not in harvested crops | Total | Pasture | Wheat | Corn | Oats | Cotton | Tobacco | Horses and mules | Beef cattle | Dairy cattle | Hogs |
| | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. | P.d. |
| United States..... | 26 | 28 | 35 | 37 | 38 | 39 | 49 | 51 | 23 | 31 | 33 | 37 | 39 | 29 | 41 | 22 | 38 | 46 | 42 | 67 | 48 | 35 | 24 | 29 | 36 | 28 | 29 | 36 |
| New England..... | 9 | 9 | 8 | 7 | 6 | 5 | 5 | 6 | 5 | 11 | 10 | 10 | 7 | 6 | 6 | 6 | 7 | 6 | 7 | 7 | 6 | 4 | 8 | 5 | 20 | 20 | 27 | |
| Middle Atlantic..... | 19 | 22 | 25 | 27 | 26 | 16 | 15 | 22 | 14 | 31 | 29 | 27 | 21 | 19 | 21 | 17 | 32 | 29 | 22 | 50 | 20 | 20 | 20 | 20 | 23 | 26 | 37 | |
| East North Central..... | 20 | 23 | 26 | 28 | 26 | 13 | 12 | 35 | 30 | 32 | 36 | 38 | 37 | 32 | 37 | 26 | 41 | 48 | 41 | 64 | 38 | 33 | 31 | 26 | 27 | 34 | 37 | |
| West North Central..... | 21 | 24 | 30 | 31 | 34 | 38 | 30 | 42 | 29 | 35 | 38 | 44 | 48 | 36 | 41 | 33 | 40 | 47 | 43 | 81 | 33 | 32 | 34 | 34 | 37 | 34 | 34 | |
| South Atlantic..... | 36 | 38 | 44 | 46 | 47 | 56 | 35 | 27 | 18 | 32 | 33 | 34 | 32 | 46 | 30 | 23 | 36 | 41 | 20 | 66 | 53 | 37 | 16 | 32 | 35 | 35 | 35 | |
| East South Central..... | 37 | 38 | 48 | 51 | 50 | 70 | 54 | 20 | 15 | 29 | 31 | 31 | 31 | 29 | 49 | 19 | 27 | 44 | 23 | 72 | 48 | 37 | 20 | 35 | 33 | 33 | 35 | |
| West South Central..... | 35 | 39 | 49 | 53 | 53 | 73 | 64 | 45 | 25 | 29 | 33 | 38 | 42 | 34 | 55 | 24 | 40 | 31 | 46 | 66 | 11 | 47 | 23 | 41 | 38 | 38 | 38 | |
| Mountain..... | 17 | 17 | 12 | 11 | 13 | 22 | 18 | 29 | 26 | 22 | 20 | 30 | 40 | 15 | 25 | 13 | 26 | 31 | 28 | 43 | 19 | 19 | 10 | 24 | 24 | 24 | 22 | |
| Pacific..... | 17 | 15 | 20 | 17 | 16 | 11 | 19 | 23 | 26 | 30 | 32 | 36 | 34 | 20 | 27 | 18 | 37 | 39 | 29 | 42 | 23 | 11 | 30 | 24 | 22 | 22 | 22 | |
| New England: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maine..... | 4 | 5 | 5 | 4 | 3 | 4 | 3 | 3 | 3 | 5 | 5 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 5 | 5 | |
| New Hampshire..... | 8 | 8 | 7 | 7 | 6 | 5 | 5 | 5 | 3 | 8 | 7 | 8 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | |
| Vermont..... | 13 | 15 | 12 | 12 | 9 | 6 | 7 | 11 | 9 | 18 | 16 | 15 | 12 | 11 | 13 | 10 | 11 | 16 | 16 | 16 | 11 | 10 | 13 | 11 | 11 | 11 | 11 | |
| Massachusetts..... | 8 | 9 | 10 | 8 | 7 | 5 | 5 | 4 | 5 | 10 | 9 | 9 | 6 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| Rhode Island..... | 20 | 19 | 20 | 18 | 16 | 12 | 11 | 14 | 10 | 22 | 21 | 19 | 15 | 12 | 12 | 9 | 13 | 7 | 7 | 7 | 8 | 12 | 7 | 16 | 13 | 13 | 13 | |
| Connecticut..... | 10 | 12 | 13 | 10 | 8 | 6 | 5 | 7 | 7 | 15 | 12 | 12 | 9 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 4 | |
| Middle Atlantic: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| New York..... | 17 | 20 | 24 | 21 | 19 | 8 | 12 | 19 | 14 | 31 | 29 | 26 | 20 | 17 | 19 | 16 | 17 | 26 | 18 | 20 | 30 | 17 | 16 | 18 | 19 | 19 | 19 | |
| New Jersey..... | 25 | 27 | 30 | 25 | 23 | 16 | 8 | 19 | 30 | 35 | 32 | 30 | 24 | 23 | 25 | 22 | 32 | 29 | 23 | 51 | 23 | 21 | 22 | 25 | 25 | 25 | 25 | |
| Pennsylvania..... | 21 | 23 | 26 | 23 | 22 | 17 | 12 | 24 | 15 | 32 | 30 | 27 | 22 | 21 | 24 | 18 | 17 | 34 | 31 | 23 | 51 | 23 | 21 | 22 | 25 | 25 | 25 | |
| East North Central: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ohio..... | 19 | 23 | 27 | 26 | 25 | 14 | 25 | 35 | 31 | 33 | 37 | 38 | 35 | 31 | 35 | 27 | 26 | 38 | 39 | 39 | 44 | 32 | 25 | 29 | 38 | 38 | 38 | |
| Indiana..... | 24 | 25 | 29 | 30 | 32 | 29 | 15 | 27 | 38 | 37 | 40 | 43 | 42 | 35 | 39 | 30 | 41 | 47 | 47 | 39 | 44 | 32 | 25 | 29 | 38 | 38 | 38 | |
| Illinois..... | 31 | 34 | 39 | 41 | 43 | 42 | 24 | 50 | 35 | 50 | 55 | 54 | 56 | 47 | 51 | 39 | 55 | 56 | 56 | 47 | 39 | 47 | 38 | 45 | 45 | 45 | 45 | |
| Michigan..... | 10 | 14 | 16 | 16 | 18 | 15 | 10 | 15 | 20 | 22 | 24 | 26 | 23 | 18 | 19 | 16 | 17 | 21 | 22 | 21 | 34 | 18 | 16 | 17 | 23 | 23 | 23 | |
| Wisconsin..... | 9 | 11 | 14 | 14 | 15 | 10 | 12 | 20 | 21 | 17 | 19 | 20 | 21 | 17 | 20 | 17 | 15 | 26 | 21 | 21 | 34 | 18 | 20 | 18 | 23 | 23 | 23 | |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| West North Central: | | | | | | | | | | | | | | | | | | | | | | | | |
| Minnesota | 9 | 13 | 17 | 21 | 25 | 27 | 12 | 18 | 33 | 33 | 25 | 33 | 36 | 40 | 32 | 36 | 26 | 27 | 32 | 43 | 40 | 33 | 26 | 27 |
| Iowa | 24 | 28 | 35 | 38 | 42 | 45 | 25 | 39 | 49 | 33 | 40 | 45 | 50 | 53 | 47 | 50 | 43 | 41 | 47 | 52 | 52 | 47 | 41 | 45 |
| Missouri | 27 | 31 | 30 | 29 | 33 | 31 | 31 | 29 | 24 | 28 | 31 | 33 | 35 | 29 | 34 | 26 | 24 | 35 | 37 | 34 | 57 | 30 | 26 | 34 |
| North Dakota | 2 | 7 | 8 | 14 | 20 | 34 | 33 | 40 | 38 | 26 | 20 | 31 | 42 | 50 | 31 | 33 | 28 | 25 | 32 | 34 | 35 | 31 | 25 | 30 |
| South Dakota | 4 | 13 | 22 | 23 | 35 | 42 | 33 | 44 | 47 | 24 | 40 | 40 | 49 | 53 | 32 | 41 | 24 | 22 | 41 | 48 | 48 | 36 | 30 | 39 |
| Nebraska | 18 | 25 | 37 | 38 | 43 | 46 | 28 | 48 | 50 | 33 | 41 | 38 | 44 | 39 | 45 | 31 | 29 | 40 | 49 | 47 | 41 | 32 | 38 | |
| Kansas | 16 | 28 | 35 | 37 | 40 | 42 | 28 | 38 | 47 | 33 | 42 | 50 | 54 | 39 | 44 | 35 | 39 | 45 | 44 | 43 | 41 | 32 | 39 | |
| South Atlantic: | | | | | | | | | | | | | | | | | | | | | | | | |
| Delaware | 42 | 47 | 50 | 42 | 39 | 36 | 23 | 32 | 53 | 50 | 60 | 53 | 51 | 47 | 46 | 49 | 44 | 52 | 63 | 46 | 48 | 39 | 50 | |
| Maryland | 31 | 31 | 34 | 29 | 29 | 26 | 31 | 19 | 23 | 40 | 35 | 43 | 41 | 38 | 37 | 36 | 39 | 32 | 48 | 39 | 48 | 36 | 25 | |
| Virginia | 20 | 27 | 26 | 26 | 25 | 31 | 19 | 20 | 18 | 29 | 24 | 24 | 22 | 20 | 25 | 18 | 24 | 23 | 27 | 46 | 43 | 20 | 12 | |
| West Virginia | 19 | 18 | 22 | 21 | 16 | 16 | 13 | 14 | 15 | 18 | 19 | 17 | 17 | 14 | 13 | 14 | 12 | 20 | 19 | 25 | 43 | 19 | 16 | |
| North Carolina | 33 | 34 | 41 | 42 | 45 | 58 | 30 | 28 | 30 | 31 | 33 | 34 | 31 | 46 | 23 | 20 | 25 | 40 | 54 | 62 | 60 | 18 | 18 | |
| South Carolina | 50 | 55 | 61 | 63 | 64 | 65 | 78 | 47 | 38 | 18 | 38 | 44 | 43 | 41 | 60 | 28 | 26 | 46 | 50 | 70 | 50 | 49 | 41 | |
| Georgia | 45 | 54 | 60 | 66 | 67 | 64 | 80 | 39 | 38 | 19 | 39 | 43 | 47 | 43 | 42 | 59 | 32 | 41 | 46 | 56 | 68 | 50 | 33 | |
| Florida | 31 | 24 | 27 | 27 | 25 | 21 | 24 | 22 | 11 | 7 | 17 | 16 | 15 | 12 | 11 | 23 | 7 | 5 | 28 | 48 | 13 | 19 | 8 | |
| East South Central: | | | | | | | | | | | | | | | | | | | | | | | | |
| Kentucky | 26 | 25 | 33 | 34 | 33 | 32 | 50 | 17 | 17 | 22 | 23 | 23 | 22 | 20 | 31 | 16 | 15 | 23 | 36 | 49 | 49 | 24 | 16 | |
| Tennessee | 35 | 31 | 41 | 41 | 41 | 58 | 25 | 20 | 16 | 29 | 29 | 31 | 31 | 29 | 41 | 19 | 19 | 29 | 43 | 67 | 44 | 31 | 30 | |
| Alabama | 47 | 49 | 58 | 60 | 53 | 61 | 77 | 46 | 26 | 16 | 35 | 36 | 38 | 41 | 38 | 60 | 24 | 25 | 53 | 65 | 49 | 34 | 46 | |
| Mississippi | 44 | 53 | 62 | 66 | 66 | 68 | 87 | 35 | 18 | 11 | 33 | 35 | 36 | 34 | 63 | 19 | 20 | 53 | 78 | 78 | 52 | 30 | 41 | |
| West South Central: | | | | | | | | | | | | | | | | | | | | | | | | |
| Arkansas | 31 | 32 | 45 | 50 | 51 | 57 | 77 | 34 | 22 | 32 | 30 | 33 | 36 | 34 | 51 | 22 | 24 | 45 | 45 | 69 | 43 | 28 | 35 | |
| Louisiana | 35 | 44 | 58 | 55 | 57 | 60 | 75 | 31 | 19 | 13 | 27 | 28 | 31 | 32 | 52 | 15 | 14 | 44 | 44 | 72 | 42 | 24 | 33 | |
| Oklahoma | 1 | 41 | 55 | 51 | 59 | 69 | 64 | 53 | 23 | 43 | 52 | 49 | 54 | 45 | 52 | 39 | 36 | 40 | 56 | 67 | 49 | 33 | 47 | |
| Texas | 38 | 42 | 50 | 53 | 53 | 60 | 76 | 61 | 48 | 27 | 26 | 20 | 36 | 40 | 31 | 59 | 21 | 20 | 52 | 64 | 48 | 20 | 42 | |
| Mountain: | | | | | | | | | | | | | | | | | | | | | | | | |
| Montana | 5 | 5 | 9 | 9 | 11 | 22 | 19 | 27 | 24 | 19 | 15 | 25 | 27 | 40 | 17 | 22 | 15 | 25 | 24 | 24 | 19 | 12 | 26 | |
| Idaho | 5 | 5 | 9 | 10 | 16 | 24 | 20 | 32 | 25 | 16 | 13 | 18 | 25 | 36 | 20 | 26 | 18 | 15 | 29 | 27 | 23 | 9 | 24 | |
| Wyoming | 3 | 4 | 8 | 8 | 12 | 18 | 19 | 26 | 24 | 11 | 26 | 16 | 28 | 43 | 9 | 18 | 8 | 25 | 24 | 29 | 13 | 22 | 28 | |
| Colorado | 13 | 11 | 23 | 18 | 23 | 31 | 22 | 41 | 36 | 21 | 35 | 26 | 35 | 42 | 23 | 34 | 19 | 35 | 36 | 42 | 30 | 16 | 32 | |
| New Mexico | 8 | 5 | 9 | 5 | 12 | 17 | 17 | 26 | 19 | 12 | 18 | 17 | 36 | 43 | 12 | 23 | 11 | 16 | 22 | 52 | 13 | 9 | 22 | |
| Arizona | 13 | 8 | 8 | 9 | 18 | 22 | 19 | 10 | 7 | 16 | 34 | 40 | 40 | 9 | 26 | 8 | 8 | 5 | 10 | 38 | 10 | 6 | 24 | |
| Utah | 5 | 5 | 9 | 8 | 11 | 11 | 12 | 13 | 10 | 6 | 23 | 12 | 16 | 17 | 7 | 12 | 6 | 5 | 10 | 12 | 9 | 5 | 9 | |
| Nevada | 10 | 8 | 11 | 12 | 9 | 8 | 7 | 11 | 8 | 6 | 14 | 9 | 15 | 19 | 5 | 5 | 5 | 5 | 12 | 6 | 6 | 4 | 11 | |
| Pacific: | | | | | | | | | | | | | | | | | | | | | | | | |
| Washington | 7 | 8 | 14 | 14 | 19 | 16 | 11 | 18 | 24 | 33 | 28 | 32 | 41 | 43 | 25 | 32 | 23 | 18 | 40 | 32 | 28 | 15 | 22 | |
| Oregon | 14 | 13 | 18 | 15 | 19 | 17 | 12 | 17 | 21 | 21 | 26 | 29 | 30 | 30 | 17 | 28 | 15 | 12 | 35 | 26 | 20 | 22 | 22 | |
| California | 20 | 18 | 23 | 21 | 21 | 15 | 10 | 20 | 24 | 32 | 34 | 36 | 32 | 19 | 25 | 17 | 15 | 32 | 34 | 42 | 21 | 11 | 37 | |

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1 Tenants owning none of the land in their farms.

2 Land in tenant farms plus rented land in part owner farms.

3 Rented land in part-owner farms for 1900 and 1920 on basis of succeeding censuses.

4 Percentages omitted for States which produced less than one-tenth of 1 per cent (0.001) of the United States crop.

TABLE 545.—*Farm mortgage debt: Total and by tenure of land, January 1, 1925, and January 1, 1928*

| Geographic division and State | Total mortgage debt | | Debt on owner-operated land | | Debt on tenant-operated land | | Debt on manager-operated land | |
|-------------------------------|---------------------|---------------|-----------------------------|---------------|------------------------------|---------------|-------------------------------|---------------|
| | 1925 | 1928 | 1925 | 1928 | 1925 | 1928 | 1925 | 1928 |
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| United States..... | 9,360,620 | 9,468,526 | 5,504,437 | 5,560,017 | 3,612,193 | 3,644,009 | 243,990 | 264,500 |
| New England..... | 123,748 | 122,494 | 113,830 | 112,315 | 7,579 | 8,227 | 2,339 | 1,952 |
| Maine..... | 26,097 | 25,252 | 25,207 | 24,323 | 743 | 806 | 147 | 123 |
| New Hampshire..... | 7,732 | 7,780 | 7,357 | 7,393 | 296 | 321 | 79 | 66 |
| Vermont..... | 28,001 | 28,322 | 24,933 | 25,050 | 2,834 | 3,077 | 234 | 195 |
| Massachusetts..... | 32,207 | 31,262 | 29,595 | 28,696 | 1,538 | 1,670 | 1,074 | 896 |
| Rhode Island..... | 2,435 | 2,455 | 2,082 | 2,092 | 273 | 296 | 80 | 67 |
| Connecticut..... | 27,276 | 27,423 | 24,656 | 24,761 | 1,896 | 2,057 | 725 | 605 |
| Middle Atlantic..... | 388,798 | 376,614 | 301,777 | 291,570 | 73,884 | 72,510 | 13,137 | 12,534 |
| New York..... | 226,776 | 219,812 | 177,110 | 171,302 | 41,153 | 40,388 | 8,513 | 8,122 |
| New Jersey..... | 41,741 | 40,370 | 33,116 | 31,945 | 7,167 | 7,034 | 1,458 | 1,391 |
| Pennsylvania..... | 120,281 | 116,432 | 91,551 | 88,323 | 25,564 | 25,088 | 3,166 | 3,021 |
| East North Central..... | 1,861,887 | 1,950,126 | 1,177,682 | 1,220,270 | 632,908 | 678,957 | 51,297 | 50,893 |
| Ohio..... | 214,409 | 222,101 | 152,979 | 151,821 | 54,146 | 63,053 | 7,284 | 7,227 |
| Indiana..... | 264,483 | 277,269 | 148,383 | 152,604 | 109,175 | 117,734 | 6,925 | 6,871 |
| Illinois..... | 630,353 | 685,363 | 293,047 | 312,372 | 338,839 | 354,672 | 18,407 | 18,321 |
| Michigan..... | 228,089 | 235,399 | 169,263 | 174,783 | 50,670 | 52,524 | 8,156 | 8,092 |
| Wisconsin..... | 504,553 | 529,992 | 414,010 | 428,636 | 80,078 | 90,974 | 10,465 | 10,382 |
| West North Central..... | 4,126,402 | 4,056,187 | 2,199,924 | 2,178,998 | 1,883,767 | 1,836,779 | 42,711 | 40,410 |
| Minnesota..... | 553,784 | 558,458 | 326,561 | 334,925 | 222,930 | 219,472 | 4,293 | 4,061 |
| Iowa..... | 1,424,352 | 1,402,178 | 765,475 | 764,415 | 642,254 | 622,035 | 16,623 | 15,728 |
| Missouri..... | 449,022 | 447,351 | 288,564 | 272,753 | 174,567 | 169,308 | 5,591 | 5,290 |
| North Dakota..... | 226,714 | 230,250 | 134,326 | 136,570 | 89,996 | 91,417 | 2,392 | 2,263 |
| South Dakota..... | 372,004 | 370,946 | 177,858 | 175,541 | 190,695 | 192,140 | 3,451 | 3,265 |
| Nebraska..... | 617,930 | 599,418 | 320,628 | 303,437 | 291,263 | 290,267 | 6,039 | 5,714 |
| Kansas..... | 482,596 | 447,586 | 206,512 | 191,357 | 271,762 | 252,140 | 4,322 | 4,089 |
| South Atlantic..... | 439,609 | 491,896 | 262,550 | 280,163 | 149,092 | 178,573 | 27,067 | 33,160 |
| Delaware..... | 8,695 | 9,469 | 4,356 | 4,283 | 3,754 | 4,469 | 588 | 717 |
| Maryland..... | 50,422 | 54,960 | 30,141 | 30,656 | 15,085 | 17,959 | 5,196 | 6,365 |
| District of Columbia..... | 304 | 354 | 82 | 83 | 30 | 36 | 192 | 235 |
| Virginia..... | 79,709 | 87,117 | 50,114 | 62,430 | 15,974 | 19,017 | 4,621 | 5,661 |
| West Virginia..... | 18,570 | 20,185 | 14,582 | 15,377 | 3,105 | 3,606 | 1,883 | 1,082 |
| North Carolina..... | 78,606 | 90,860 | 47,427 | 53,099 | 29,821 | 35,503 | 1,358 | 1,664 |
| South Carolina..... | 68,735 | 77,214 | 34,416 | 30,286 | 32,287 | 38,439 | 2,032 | 2,489 |
| Georgia..... | 109,060 | 123,305 | 53,826 | 57,299 | 48,189 | 57,374 | 7,045 | 8,632 |
| Florida..... | 25,808 | 28,436 | 18,606 | 20,041 | 1,747 | 2,080 | 5,155 | 6,315 |
| East South Central..... | 356,378 | 381,497 | 218,752 | 239,725 | 131,955 | 135,132 | 5,671 | 6,640 |
| Kentucky..... | 94,549 | 103,798 | 71,006 | 79,583 | 22,828 | 23,378 | 715 | 837 |
| Tennessee..... | 85,857 | 96,711 | 59,274 | 69,382 | 25,863 | 26,486 | 720 | 843 |
| Alabama..... | 66,410 | 69,488 | 36,365 | 38,571 | 29,030 | 29,729 | 1,015 | 1,188 |
| Mississippi..... | 109,562 | 111,500 | 52,107 | 52,189 | 54,234 | 55,539 | 3,221 | 3,772 |
| West South Central..... | 860,269 | 901,252 | 415,694 | 453,965 | 421,607 | 420,460 | 22,978 | 26,827 |
| Arkansas..... | 97,809 | 103,464 | 51,726 | 56,982 | 43,004 | 42,887 | 3,079 | 3,595 |
| Louisiana..... | 57,910 | 61,760 | 33,062 | 36,337 | 21,060 | 21,023 | 3,768 | 4,400 |
| Oklahoma..... | 218,963 | 228,513 | 99,366 | 108,835 | 117,207 | 116,888 | 2,390 | 2,790 |
| Texas..... | 485,587 | 507,515 | 231,530 | 251,811 | 240,816 | 239,662 | 13,741 | 16,042 |
| Mountain..... | 533,787 | 496,551 | 319,965 | 294,116 | 199,456 | 185,946 | 14,366 | 16,489 |
| Montana..... | 116,616 | 104,862 | 69,654 | 60,588 | 44,678 | 41,652 | 2,284 | 2,622 |
| Idaho..... | 107,355 | 100,033 | 67,479 | 62,517 | 38,296 | 35,702 | 1,580 | 1,814 |
| Wyoming..... | 43,364 | 40,922 | 25,016 | 23,518 | 16,954 | 15,805 | 1,394 | 1,599 |
| Colorado..... | 153,727 | 144,464 | 82,209 | 77,078 | 68,214 | 63,594 | 3,304 | 3,792 |
| New Mexico..... | 28,784 | 26,900 | 16,754 | 15,388 | 10,651 | 9,929 | 1,379 | 1,583 |
| Arizona..... | 29,545 | 29,006 | 16,396 | 16,175 | 10,491 | 9,781 | 2,658 | 3,050 |
| Utah..... | 39,152 | 36,367 | 31,086 | 28,785 | 7,779 | 7,252 | 267 | 330 |
| Nevada..... | 15,244 | 13,997 | 11,371 | 10,067 | 2,393 | 2,231 | 1,480 | 1,699 |
| Pacific..... | 669,742 | 691,909 | 494,273 | 388,889 | 111,045 | 127,425 | 64,424 | 75,595 |
| Washington..... | 121,371 | 120,523 | 91,912 | 86,609 | 25,207 | 28,925 | 4,252 | 4,989 |
| Oregon..... | 105,603 | 110,875 | 82,036 | 83,896 | 19,988 | 22,937 | 3,479 | 4,082 |
| California..... | 442,868 | 460,511 | 320,325 | 318,424 | 65,850 | 75,563 | 56,693 | 66,524 |

TABLE 546.—*Rural and farm population, percentage of total population gainfully employed in agriculture, and percentage of total*

| Census year | Percentage of population | | | Percentage gainfully employed in agriculture |
|-------------|---|---|----------|--|
| | "Rural" outside of places 8,000 or more | "Rural" outside of places 2,500 or more | On farms | |
| 1820..... | 95.1 | ..... | ..... | 83.1 |
| 1830..... | 93.3 | ..... | ..... | ..... |
| 1840..... | 91.5 | ..... | ..... | 77.5 |
| 1850..... | 87.5 | ..... | ..... | ..... |
| 1860..... | 83.9 | ..... | ..... | ..... |
| 1870..... | 79.1 | ..... | ..... | 47.5 |
| 1880..... | 77.4 | 70.5 | ..... | 44.3 |
| 1890..... | 71.0 | 63.9 | ..... | 39.2 |
| 1900..... | 67.1 | 60.0 | ..... | 35.7 |
| 1910..... | 61.3 | 54.2 | 34.7 | 33.2 |
| 1920..... | 56.2 | 48.6 | 29.5 | 26.3 |
| 1925..... | ..... | ..... | 25.3 | ..... |

Bureau of Agricultural Economics. Compiled from reports of Bureau of the Census.

TABLE 547.—*Estimated farm population¹ of the United States, 1910, 1920-1929, by years*

| Year | Number | Year | Number |
|-----------|------------|----------------------------|------------|
| 1910..... | 31,400,000 | 1925 (Census of 1925)..... | 28,981,668 |
| 1920..... | 31,000,000 | 1926..... | 28,502,000 |
| 1921..... | 30,600,000 | 1927..... | 27,853,000 |
| 1922..... | 30,200,000 | 1928..... | 27,699,000 |
| 1923..... | 29,800,000 | 1929..... | 27,511,000 |
| 1924..... | 29,400,000 | ..... | ..... |

Bureau of the Census.

¹ Farm population, as here used, is in accord with the definition in the 1925 Census of Agriculture—namely, "all persons living on farms."TABLE 548.—*Changes in farm population and land utilization, United States, census years 1850-1925*

| Item | Unit | 1850 | 1860 | 1870 | 1880 | 1890 | 1900 | 1910 | 1920 | 1925 |
|------------------------------|----------------------|---------|---------|---------|---------|---------|---------|---------|------------------|------------------|
| Number of farms..... | Thousands..... | 1,449 | 2,044 | 2,660 | 4,009 | 4,565 | 5,737 | 6,362 | 6,448 | 6,372 |
| Farm population..... | do..... | ..... | ..... | ..... | ..... | ..... | ..... | 32,077 | 31,614 | 28,982 |
| Do..... | Number per farm..... | ..... | ..... | ..... | ..... | ..... | ..... | 5.0 | 4.9 | 4.5 |
| Land in farms..... | 1,000 acres..... | 293,561 | 407,213 | 407,735 | 536,082 | 623,219 | 838,592 | 878,798 | 955,884 | 924,319 |
| Improved land in farms..... | do..... | 113,033 | 163,111 | 188,921 | 284,771 | 357,617 | 414,498 | 478,452 | 503,073 | (¹) |
| Farm land per farm..... | Acres..... | 202.6 | 199.2 | 153.3 | 133.7 | 136.5 | 146.2 | 138.1 | 148.2 | 145.1 |
| Improved land per farm..... | do..... | 78.0 | 79.8 | 71.0 | 71.0 | 78.3 | 72.2 | 75.2 | 78.0 | (¹) |
| Land in harvested crops..... | 1,000 acres..... | ..... | ..... | ..... | 177,500 | 232,500 | 293,000 | 321,500 | 358,000 | 349,600 |
| Intertilled crops..... | do..... | ..... | ..... | ..... | 89,814 | 110,530 | 143,727 | 161,706 | 160,097 | 152,300 |
| Small grain crops..... | do..... | ..... | ..... | ..... | 57,523 | 69,929 | 92,408 | 93,796 | 128,669 | 103,900 |
| Hay..... | do..... | ..... | ..... | ..... | 31,131 | 53,549 | 59,284 | 69,027 | 72,889 | 93,341 |
| Pasture..... | do..... | ..... | ..... | ..... | ..... | ..... | ..... | 291,440 | (¹) | 407,936 |
| Forest and woodland..... | do..... | ..... | ..... | ..... | ..... | ..... | ..... | 190,866 | 167,731 | 143,794 |

Bureau of Agricultural Economics. Based on census data.

¹ Data not available.

TABLE 549.—*Population, United States: Census years, 1870–1920; estimated, 1928*

| | 1870 ¹ | 1880 ¹ | 1890 ¹ | 1900 ¹ | 1910 ¹ | 1920 ¹ | 1928 ¹ |
|---------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| United States..... | 38,558,371 | 50,155,783 | 62,047,714 | 75,994,575 | 91,972,266 | 105,710,620 | 119,310,534 |
| Alabama..... | 996,992 | 1,262,505 | 1,513,401 | 1,828,697 | 2,138,093 | 2,348,174 | 2,562,000 |
| Arizona..... | 9,658 | 40,440 | 88,243 | 122,931 | 204,354 | 334,162 | 468,000 |
| Arkansas..... | 484,471 | 802,525 | 1,128,211 | 1,311,564 | 1,574,449 | 1,752,204 | 1,935,000 |
| California..... | 560,247 | 864,604 | 1,213,398 | 1,485,053 | 2,377,549 | 3,426,861 | 4,501,000 |
| Colorado..... | 39,864 | 194,327 | 413,249 | 598,700 | 799,024 | 1,039,629 | 1,083,000 |
| Connecticut..... | 537,454 | 622,700 | 746,258 | 909,420 | 1,114,756 | 1,380,631 | 1,653,000 |
| Delaware..... | 125,015 | 146,608 | 168,493 | 194,735 | 202,322 | 223,003 | 243,000 |
| District of Columbia..... | 131,700 | 177,624 | 230,392 | 278,718 | 331,069 | 437,571 | 546,000 |
| Florida..... | 187,748 | 269,493 | 391,422 | 528,542 | 752,619 | 968,470 | 1,389,000 |
| Georgia..... | 1,184,109 | 1,542,180 | 1,837,353 | 2,210,331 | 2,609,121 | 2,895,832 | 3,188,000 |
| Idaho..... | 14,999 | 32,610 | 88,548 | 161,772 | 325,594 | 431,866 | 541,000 |
| Illinois..... | 2,539,891 | 3,077,871 | 3,826,352 | 4,821,550 | 5,638,591 | 6,485,280 | 7,351,000 |
| Indiana..... | 1,680,637 | 1,978,301 | 2,192,404 | 2,510,462 | 2,700,876 | 2,930,390 | 3,164,000 |
| Iowa..... | 1,194,020 | 1,624,615 | 1,912,297 | 2,231,853 | 2,224,771 | 2,404,021 | 2,427,000 |
| Kansas..... | 364,399 | 995,096 | 1,428,108 | 1,470,495 | 1,690,949 | 1,769,257 | 1,832,000 |
| Kentucky..... | 1,321,011 | 1,648,690 | 1,858,635 | 2,147,174 | 2,289,905 | 2,416,630 | 2,546,000 |
| Louisiana..... | 725,915 | 939,946 | 1,118,588 | 1,381,625 | 1,656,398 | 1,798,509 | 1,943,000 |
| Maine..... | 626,915 | 648,936 | 661,086 | 694,466 | 742,371 | 768,014 | 794,000 |
| Maryland..... | 780,894 | 934,943 | 1,042,390 | 1,188,404 | 1,295,346 | 1,449,661 | 1,608,000 |
| Massachusetts..... | 1,457,351 | 1,733,085 | 2,238,947 | 2,805,346 | 3,366,416 | 3,852,556 | 4,269,000 |
| Michigan..... | 1,184,059 | 1,636,937 | 2,093,890 | 2,420,982 | 2,810,173 | 3,668,412 | 4,547,000 |
| Minnesota..... | 439,706 | 780,773 | 1,310,283 | 1,751,394 | 2,075,708 | 2,387,125 | 2,706,000 |
| Mississippi..... | 827,922 | 1,131,597 | 1,289,600 | 1,551,270 | 1,797,114 | 1,790,618 | 1,790,618 |
| Missouri..... | 1,721,295 | 2,168,380 | 2,679,185 | 3,106,965 | 3,293,335 | 3,404,055 | 3,517,000 |
| Montana..... | 20,595 | 39,159 | 142,924 | 243,329 | 376,053 | 548,889 | 548,889 |
| Nebraska..... | 122,993 | 452,402 | 1,062,656 | 1,066,300 | 1,192,214 | 1,296,372 | 1,403,000 |
| Nevada..... | 42,491 | 62,266 | 47,355 | 42,335 | 81,875 | 77,407 | 77,407 |
| New Hampshire..... | 318,300 | 346,991 | 376,530 | 411,588 | 430,572 | 443,083 | 455,000 |
| New Jersey..... | 906,096 | 1,131,116 | 1,444,933 | 1,883,669 | 2,537,167 | 3,155,900 | 3,789,000 |
| New Mexico..... | 91,874 | 119,565 | 160,282 | 195,310 | 327,301 | 360,350 | 394,000 |
| New York..... | 4,382,529 | 5,082,871 | 6,003,174 | 7,268,894 | 9,113,614 | 10,385,227 | 11,493,000 |
| North Carolina..... | 1,071,361 | 1,399,750 | 1,617,949 | 1,893,810 | 2,206,287 | 2,569,123 | 2,920,000 |
| North Dakota..... | 2,405 | 36,909 | 190,983 | 319,146 | 577,056 | 646,872 | 641,192 |
| Ohio..... | 2,665,260 | 3,198,062 | 3,672,329 | 4,157,545 | 4,767,121 | 5,750,394 | 6,774,000 |
| Oklahoma..... | | | 7,258,657 | 7,790,391 | 1,657,155 | 2,028,283 | 2,407,000 |
| Oregon..... | 90,923 | 174,768 | 317,704 | 413,536 | 672,765 | 783,389 | 896,000 |
| Pennsylvania..... | 3,521,951 | 4,282,891 | 5,258,113 | 6,302,115 | 7,665,111 | 8,720,017 | 9,798,000 |
| Rhode Island..... | 217,353 | 276,531 | 345,506 | 428,556 | 542,610 | 604,397 | 711,000 |
| South Carolina..... | 705,606 | 995,577 | 1,151,149 | 1,340,316 | 1,515,400 | 1,683,724 | 1,855,000 |
| South Dakota..... | 11,776 | 98,268 | 348,600 | 401,570 | 583,888 | 636,647 | 701,000 |
| Tennessee..... | 1,258,520 | 1,542,359 | 1,767,518 | 2,020,616 | 2,184,789 | 2,337,885 | 2,494,000 |
| Texas..... | 818,579 | 1,591,749 | 2,235,527 | 3,048,710 | 3,896,542 | 4,663,228 | 5,447,000 |
| Utah..... | 86,786 | 143,963 | 210,779 | 276,749 | 373,351 | 449,396 | 527,000 |
| Vermont..... | 330,551 | 332,286 | 332,422 | 343,641 | 355,956 | 352,428 | 352,428 |
| Virginia..... | 1,225,163 | 1,612,565 | 1,655,980 | 1,854,184 | 2,061,612 | 2,309,187 | 2,562,000 |
| Washington..... | 23,955 | 75,116 | 357,232 | 518,103 | 1,141,990 | 1,356,621 | 1,576,000 |
| West Virginia..... | 442,014 | 618,457 | 762,794 | 958,800 | 1,221,119 | 1,463,701 | 1,712,000 |
| Wisconsin..... | 1,054,670 | 1,315,497 | 1,693,330 | 2,069,042 | 2,333,890 | 2,632,067 | 2,937,000 |
| Wyoming..... | 9,118 | 20,789 | 62,555 | 92,531 | 145,965 | 194,402 | 245,000 |

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¹ Enumeration of United States census.² Estimate of the Bureau of the Census.³ Includes population (325,464) of Indian Territory and Indian reservations, specially enumerated in 1890, but not included in the general report on population for 1890.⁴ Population Jan. 1, 1920; decrease 1910 to 1920.⁵ Estimate not used, result unsatisfactory.⁶ Population State census, 1925.⁷ Includes population (180,182 in 1890 and 392,060 in 1900) of Indian Territory.

TABLE 550.—*Farm family living expenditures, Vinton, Jackson, and Meigs Counties, Ohio, and Laurel County, Ky.¹*

| | Vinton, Jackson, and Meigs Counties, Ohio | | | | Laurel County, Ky. | | | |
|---|--|----------------|----------------|--|---------------------------|----------------|----------------|--|
| | Fur- nished by farm | Pur- chased | Total | Per cent of living expend- iture | Fur- nished by farm | Pur- chased | Total | Per cent of living expend- iture |
| | Dollars 401 | Dollars 532 | Dollars 933 | Pct. 100.0 | Dollars 365 | Dollars 324 | Dollars 689 | Pct. 100.0 |
| All family living..... | | | | | | | | |
| Food, including groceries..... | 322 | 135 | 457 | 49.0 | 308 | 114 | 422 | 61.2 |
| Clothing..... | | 156 | 156 | 16.7 | ² 1 | 93 | 94 | 13.6 |
| Rent (10 per cent value of house)..... | 67 | | 67 | 7.2 | 44 | | 44 | 6.5 |
| Furniture and furnishings..... | | 31 | 31 | 3.3 | | 15 | 15 | 2.1 |
| Operation goods..... | 12 | 86 | 98 | 10.5 | 11 | 36 | 47 | 6.8 |
| Maintenance of health..... | | 31 | 31 | 3.3 | | 16 | 16 | 2.3 |
| Advancement..... | | 46 | 46 | 4.9 | | 30 | 30 | 4.4 |
| Personal..... | | 29 | 29 | 3.1 | ³ 1 | 17 | 18 | 2.6 |
| Insurance..... | | 13 | 13 | 1.4 | | 3 | 3 | .5 |
| Unclassified..... | | 5 | 5 | .6 | | 0 | 0 | .0 |
| Per cent of total furnished and purchased..... | 43.0 | 57.0 | 100.0 | 100.0 | 52.9 | 47.1 | 100.0 | 100.0 |

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¹ The Ohio study is for 1 year ended Mar. 31, 1927, and the Kentucky study 1 year ended June 30, 1923.² Wool, grown on the farm and made into clothing.³ Tobacco, grown on the farm.TABLE 551.—*Distribution of value of goods used and proportion of total living furnished by farm for farm families of Vinton, Jackson, and Meigs Counties, Ohio, and Laurel County, Ky.*

VINTON, JACKSON, AND MEIGS COUNTIES, OHIO. YEAR ENDING MARCH 31, 1927

| | Groups of value of goods used | | | | |
|---|-------------------------------|-------------------|---------------------|---------------------|---------------|
| | Below \$600 | \$600 to \$999 | \$900 to \$1,199 | \$1,200 and over | All groups |
| | Number | Number | Number | Number | Number |
| Families..... | 49 | 102 | 93 | 55 | 300 |
| Average size of family (persons)..... | 2.4 | 3.5 | 4.1 | 5.5 | 3.9 |
| Average size of household (persons)..... | 2.6 | 3.8 | 4.7 | 6.1 | 4.3 |
| | Dollars | Dollars | Dollars | Dollars | Dollars |
| Average value of goods used per family..... | 485 | 755 | 1,037 | 1,171 | 933 |
| | Per cent | Per cent | Per cent | Per cent | Per cent |
| Distribution of value of goods used: | | | | | |
| Food..... | 58.1 | 61.7 | 49.3 | 43.5 | 49.0 |
| Clothing..... | 11.7 | 14.4 | 17.1 | 19.9 | 16.7 |
| Rent..... | 8.4 | 8.5 | 6.9 | 6.0 | 7.2 |
| Furniture and furnishings..... | 2.1 | 2.7 | 3.0 | 4.6 | 3.3 |
| Operation goods..... | 10.8 | 11.2 | 10.5 | 9.8 | 10.5 |
| Maintenance of health..... | 2.6 | 2.7 | 3.4 | 4.0 | 3.3 |
| Advancement..... | 3.2 | 3.4 | 4.7 | 6.8 | 4.9 |
| Personal..... | 2.9 | 3.6 | 3.3 | 2.7 | 3.1 |
| Insurance, life, and health..... | .2 | .6 | 1.5 | 2.3 | 1.4 |
| Unclassified..... | | 1.2 | .3 | .4 | .6 |
| Total..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Living furnished by farm..... | 49.4 | 46.5 | 42.8 | 38.1 | 43.0 |
| Living purchased..... | 50.6 | 53.5 | 57.2 | 61.9 | 57.0 |
| Total..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Food furnished by farm..... | 66.3 | 70.4 | 70.5 | 71.9 | 70.4 |
| Food purchased..... | 33.7 | 29.6 | 29.5 | 28.1 | 29.6 |
| Total..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

TABLE 551.—*Distribution of value of goods used and proportion of total living furnished by farm for farm families of Vinton, Jackson, and Meigs Counties, Ohio, and Laurel County, Ky.—Continued*

LAUREL COUNTY, KY. YEAR ENDING JUNE 30, 1928

| | Groups of value of goods used | | | | |
|---|-------------------------------|----------------|------------------|------------------|------------|
| | Below \$600 | \$600 to \$899 | \$900 to \$1,199 | \$1,200 and over | All groups |
| | Number | Number | Number | Number | Number |
| Families..... | 91 | 74 | 26 | 12 | 203 |
| Average size of family (persons)..... | 4.0 | 5.3 | 5.5 | 6.5 | 4.8 |
| Average size of household (persons)..... | 4.4 | 5.8 | 5.8 | 7.2 | 5.3 |
| <hr/> | | | | | |
| | Dollars | Dollars | Dollars | Dollars | Dollars |
| Average value of goods used per family..... | 453 | 736 | 1,034 | 1,453 | 689 |
| <hr/> | | | | | |
| Distribution of value of goods used: | Per cent | Per cent | Per cent | Per cent | Per cent |
| Food..... | 68.1 | 62.3 | 54.4 | 51.6 | 61.2 |
| Clothing..... | 10.3 | 13.4 | 15.1 | 19.7 | 13.6 |
| Rent..... | 6.5 | 6.1 | 7.1 | 6.6 | 6.5 |
| Furniture and furnishings..... | 1.4 | 2.3 | 3.1 | 1.7 | 2.1 |
| Operation goods..... | 7.0 | 6.4 | 7.2 | 6.9 | 6.8 |
| Maintenance of health..... | 1.5 | 2.4 | 3.8 | 1.5 | 2.3 |
| Advancement..... | 3.1 | 3.6 | 6.4 | 7.1 | 4.4 |
| Personal..... | 2.0 | 3.1 | 1.9 | 3.3 | 2.6 |
| Insurance, life, and health..... | | .4 | .9 | 1.6 | .5 |
| Unclassified..... | .1 | .0 | .1 | .0 | .0 |
| Total..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| <hr/> | | | | | |
| Living furnished by farm..... | 57.5 | 53.8 | 50.4 | 43.4 | 52.9 |
| Living purchased..... | 42.5 | 46.2 | 49.6 | 56.6 | 47.1 |
| Total..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| <hr/> | | | | | |
| Food furnished by farm..... | 71.2 | 73.4 | 77.8 | 69.7 | 73.0 |
| Food purchased..... | 28.8 | 26.6 | 22.2 | 30.3 | 27.0 |
| Total..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

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TABLE 552.—*Associations marketing dairy products: Number listed 1929, and estimated business, 1928*

| State | Creameries | | Cheese factories | | Milk distributing associations | | Milk bargaining associations | | Miscellaneous ¹ | | Total associations | |
|--------------------|---------------|--------------------|------------------|--------------------|--------------------------------|--------------------|------------------------------|--------------------|----------------------------|--------------------|--------------------|--------------------|
| | Number listed | Estimated business | Number listed | Estimated business | Number listed | Estimated business | Number listed | Estimated business | Number listed | Estimated business | Number listed | Estimated business |
| | | Thousands | | Thousands | | Thousands | | Thousands | | Thousands | | Thousands |
| New York..... | 6 | 420 | 30 | 1,300 | 9 | 90,000 | 1 | 30,000 | 23 | 700 | 69 | 122,420 |
| Minnesota..... | 624 | 85,000 | 30 | 1,400 | 3 | 11,000 | | | 6 | 1,200 | 663 | 98,600 |
| Wisconsin..... | 255 | 50,000 | 592 | 22,500 | 12 | 5,000 | 5 | 15,000 | 66 | 1,500 | 930 | 94,000 |
| Pennsylvania..... | 18 | 1,200 | 5 | 140 | 7 | 1,000 | 2 | 45,000 | 7 | 600 | 39 | 47,940 |
| Iowa..... | 248 | 40,000 | | | 3 | 500 | 4 | 3,000 | 4 | 300 | 259 | 43,800 |
| Massachusetts..... | 3 | 60 | | | 9 | 5,000 | 1 | 35,000 | | | 13 | 40,060 |
| California..... | 14 | 18,000 | | | 3 | 8,000 | 2 | 7,000 | 1 | 60 | 20 | 33,060 |
| Michigan..... | 53 | 9,500 | 9 | 510 | 9 | 3,100 | 2 | 9,000 | 12 | 2,500 | 85 | 24,610 |
| Ohio..... | 6 | 1,400 | 6 | 90 | 5 | 5,000 | 9 | 12,000 | 6 | 1,100 | 32 | 19,590 |
| Washington..... | 14 | 6,500 | 2 | 550 | 7 | 3,000 | 1 | 3,000 | 3 | 3,900 | 27 | 16,950 |
| Connecticut..... | 2 | 20 | | | 2 | 200 | 1 | 15,000 | 1 | 60 | 6 | 15,280 |
| Maryland..... | | | 1 | | 1 | 400 | 2 | 12,000 | | | 3 | 12,400 |
| Vermont..... | 18 | 1,650 | 1 | 150 | 13 | 8,500 | | | 3 | 300 | 35 | 10,600 |
| All others..... | 139 | 31,250 | 65 | 3,360 | 31 | 9,300 | 17 | 14,000 | 67 | 2,780 | 319 | 60,690 |
| United States..... | 1,400 | 245,000 | 740 | 30,000 | 114 | 150,000 | 47 | 200,000 | 199 | 15,000 | 2,500 | 640,000 |

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¹ Including federations, sales agencies, cream stations, warehouse associations, associations renting dairy plants, etc.

TABLE 553.—Livestock receipts, sales, and purchases by terminal market cooperative sales agencies, 1928

| Market | Num- ber of agen- cies | Animals received, 1928 | | | | Animals purchased, 1928 | | | | Total animals hand- led for traders | Total animals | Sales Thousands | Purchases Thousands | Total business Thousands |
|-----------------------|---------------------------------|-------------------------|-----------|-----------|------------|-------------------------|--------|---------|---------|--|------------------|------------------------|----------------------------|------------------------------------|
| | | Cattle and calves | Hogs | Sheep | Total | Cattle and calves | Hogs | Sheep | Total | | | | | |
| Buffalo..... | 1 | 39,828 | 304,175 | 164,042 | 508,045 | 5,573 | --- | 52,549 | 58,122 | 14,234 | 508,045 | \$9,185 | --- | \$9,185 |
| Chicago..... | 2 | 172,469 | 1,307,999 | 427,310 | 1,907,748 | 112 | --- | --- | --- | 14,234 | 1,907,748 | 47,189 | \$886 | 48,075 |
| Cincinnati..... | 1 | 47,859 | 280,237 | 34,968 | 363,064 | --- | --- | 23 | --- | 2,091 | 363,064 | 7,842 | 6 | 7,848 |
| Cleveland..... | 1 | 41,003 | 108,927 | 101,293 | 341,215 | --- | --- | --- | --- | --- | 341,215 | 6,210 | --- | 6,210 |
| Denver..... | 1 | 12,398 | 90,297 | 83,360 | 195,064 | 9,513 | 165 | 56,218 | 65,896 | 1,663 | 262,623 | 3,812 | 1,064 | 4,896 |
| Detroit..... | 1 | 92,380 | 176,113 | 147,203 | 415,728 | 3,463 | --- | 26,419 | 29,882 | 1,660 | 446,270 | 8,188 | 377 | 8,566 |
| East St. Louis..... | 2 | 330,183 | 1,617,798 | 162,378 | 2,110,359 | 10,081 | 332 | 432 | 10,865 | 30,961 | 2,132,185 | 48,658 | 556 | 49,213 |
| Evansville..... | 1 | 26,879 | 102,511 | 6,938 | 136,328 | --- | --- | --- | --- | --- | 136,328 | 3,077 | --- | 3,077 |
| Fort Worth..... | 1 | 56,081 | 8,710 | 5,752 | 70,543 | 1,098 | 33 | 721 | 1,852 | 1,089 | 73,484 | 3,426 | 63 | 3,489 |
| Indianapolis..... | 1 | 105,345 | 663,149 | 54,680 | 823,174 | 316 | 928 | 354 | 1,598 | 5,165 | 829,937 | 19,440 | 36 | 19,476 |
| Kansas City..... | 2 | 87,270 | 353,050 | 74,332 | 536,677 | 33,755 | 3,744 | 19,937 | 59,436 | 5,661 | 601,774 | 14,913 | 2,664 | 17,577 |
| Memphis..... | 1 | 94,908 | 91,045 | 6,332 | 192,285 | --- | --- | --- | --- | --- | 192,285 | 3,989 | --- | 3,989 |
| Milwaukee..... | 1 | 5,831 | 52,339 | 5,738 | 63,908 | --- | --- | --- | --- | --- | 63,908 | 1,259 | --- | 1,259 |
| Minneapolis..... | 1 | 43,752 | 429,446 | 8,870 | 514,077 | 4,035 | 1,432 | 30,011 | 35,478 | 4,270 | 533,825 | 13,004 | 508 | 13,512 |
| Omaha..... | 1 | 13,330 | 180,628 | 2,090 | 196,057 | --- | --- | --- | --- | --- | 196,057 | 4,333 | --- | 4,333 |
| Pennsylvania..... | 1 | 25,660 | 206,559 | 70,715 | 311,934 | --- | --- | --- | --- | --- | 311,934 | 5,648 | --- | 5,648 |
| Pittsburgh..... | 1 | 60,379 | 454,245 | 40,927 | 555,551 | 9,222 | 378 | 1,754 | 11,354 | 3,447 | 570,352 | 14,155 | 708 | 14,863 |
| St. Louis..... | 2 | 53,676 | 572,127 | 48,585 | 674,388 | 5,777 | 1,159 | 5,709 | 12,645 | 18,129 | 705,162 | 18,237 | 442 | 18,679 |
| South St. Paul..... | 1 | 401,952 | 1,226,430 | 188,611 | 1,836,993 | 17,057 | 6,535 | 9,734 | 33,326 | 3,654 | 1,863,973 | 43,005 | 1,102 | 44,107 |
| Springfield, Ill..... | 3 | 1,749 | 26,836 | --- | 29,084 | --- | --- | --- | --- | --- | 29,084 | 617 | --- | 617 |
| Springfield, Mo..... | 1 | 8,764 | 30,578 | 2,889 | 42,029 | --- | --- | --- | --- | --- | 42,029 | 738 | --- | 738 |
| Wichita..... | 1 | 29,963 | 80,191 | 8,963 | 118,217 | 2,234 | 2,275 | 158 | 4,667 | 808 | 123,692 | 3,487 | 219 | 3,707 |
| Total..... | 28 | 1,751,599 | 8,483,413 | 1,686,889 | 11,921,901 | 104,226 | 16,992 | 204,039 | 325,267 | 91,832 | 12,339,000 | 279,674 | 8,741 | 288,415 |

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TABLE 554.—*Wheat pools, volume of wheat received, 1921-22 to 1928-29*

[Data from reports to U. S. Department of Agriculture]

| Association | Address | Year organ- ized | 1921-22 | 1922-23 | 1923-24 | 1924-25 | 1925-26 | 1926-27 | 1927-28 | 1928-29 |
|---|-------------------|------------------------|----------------------------|-------------|------------------|------------------|------------------|------------|------------------|-----------|
| California Farm Bureau Exchange..... | Berkeley..... | 1922 | | 1,295,571 | 2,344,588 | | | | | |
| Colorado Wheat Growers Association..... | Denver..... | 1922 | | 87,795 | 1,301,666 | | | | | |
| Idaho Wheat Growers Association..... | Lewiston..... | 1920 | { 1,270,961 + 917,879 } | + 424,000 | (¹) | 1,191,500 | 584,478 | 400,000 | (²) | |
| Central States Soft Wheat Growers Association ¹ | Indianapolis..... | 1924 | | | | 1,524,250 | 3,157,952 | 4,177,453 | 2,206,652 | 40,000 |
| Kansas Wheat Growers Association..... | Wichita..... | { 1921 1924 } | | + 2,335,751 | + 2,052,800 | 6,138,112 | 2,631,758 | 4,055,243 | 2,465,423 | 4,692,517 |
| Kansas Cooperative Wheat Marketing Association..... | Minneapolis..... | 1923 | | | 523,644 | 1,713,136 | 1,341,938 | 799,183 | 568,790 | 587,394 |
| Minnesota Wheat Growers Cooperative Market- ing Association..... | | | | | | | (³) | | | |
| Montana Wheat Growers Association..... | Lewistown..... | 1921 | | 6,048,000 | 4,390,000 | 1,551,069 | 662,421 | 818,292 | 587,524 | |
| Nebraska Wheat Growers Association..... | Hastings..... | 1922 | | 396,860 | 550,000 | 1,202,536 | 3,202,300 | 1,300,000 | 2,420,169 | 3,161,805 |
| North Dakota Wheat Growers Association..... | Grand Forks..... | 1922 | | 2,961,763 | 2,067,864 | 3,867,881 | + 2,900,675 | 2,436,999 | 1,448,000 | 5,398,100 |
| Oklahoma Wheat Growers Association..... | Enid..... | 1921 | | + 2,961,074 | + 4,560,787 | 6,281,067 | (⁴) | | | |
| Oregon Cooperative Grain Growers..... | Portland..... | 1921 | + 3,725,435 | + 2,364,063 | + 3,426,616 | (⁵) | 2,100,000 | 123,210 | 2,085,257 | |
| South Dakota Wheat Growers Association..... | Aberdeen..... | 1923 | | 7,218,520 | 7,120,489 | 2,048,475 | + 341,918 | 3,384,446 | 553,731 | 745,000 |
| Texas Wheat Growers Association..... | Amarillo..... | 1922 | + 5,458,463 | + 2,475,784 | + 3,828,528 | (⁶) | | | | |
| Washington Wheat Growers Association..... | Spokane..... | 1920 | 11,372,768 | 21,589,181 | 26,791,209 | 27,967,244 | 16,823,560 | 17,494,726 | 12,335,546 | |
| Total..... | | | | | | | | | | |

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¹ As reported by associations.² Ceased operating.³ Including 1,270,961 bushels for 10 northern counties of Idaho, marketed through Washington Wheat Growers Association, and 917,879 bushels for southern counties as a separate pool.⁴ Marketed through Northwest Wheat Growers Association.⁵ Formerly Indiana Wheat Growers Association.⁶ Crops of 1922 and 1923 handled by Kansas Wheat Growers Association, which was superseded in 1924 by the Kansas Cooperative Wheat Marketing Association.⁷ Marketed through Southwest Wheat Growers Association.⁸ Marketed through Northwest Wheat Growers Association.

TABLE 555.—*Livestock handled: Sales and purchases by terminal market cooperative sales agencies, 1917-1929.*

[Number of associations reporting indicated in parentheses]

| Year | Animals handled | | | | Amount of business | | |
|-----------|-----------------------|----------------|----------------|-----------------------|--------------------|----------------|------------------|
| | Receipts ¹ | | | Total animals handled | Sales | Purchases | Total |
| | Cattle and calves | Hogs | Sheep | | | | |
| 1918..... | (2) 30,528 | (2) 139,483 | (2) 7,548 | (3) 189,555 | (4) \$12,394,348 | (1) \$15,901 | (4) \$12,400,249 |
| 1919..... | (3) 63,876 | (3) 381,127 | (3) 22,940 | (4) 563,383 | (6) 35,178,255 | (3) 622,335 | (6) 35,800,590 |
| 1920..... | (3) 85,313 | (3) 536,380 | (3) 29,676 | (4) 748,255 | (6) 37,419,935 | (3) 458,824 | (6) 37,878,759 |
| 1921..... | (5) 163,361 | (5) 912,095 | (5) 103,101 | (6) 1,310,628 | (6) 35,309,401 | (4) 894,972 | (6) 36,204,373 |
| 1922..... | (15) 736,982 | (15) 3,414,015 | (15) 352,861 | (16) 4,512,408 | (18) 101,818,588 | (7) 3,069,638 | (18) 104,888,226 |
| 1923..... | (22) 1,408,322 | (22) 7,732,437 | (22) 733,552 | (23) 9,933,445 | (22) 191,954,106 | (11) 4,631,630 | (23) 196,585,736 |
| 1924..... | (25) 1,893,325 | (25) 9,238,070 | (25) 1,202,616 | (26) 11,332,304 | (24) 231,372,776 | (13) 5,222,121 | (24) 236,594,897 |
| 1925..... | (25) 1,881,241 | (25) 7,377,084 | (25) 1,350,311 | (26) 10,666,069 | (24) 271,797,282 | (15) 7,923,372 | (24) 279,720,654 |
| 1926..... | (25) 2,003,014 | (25) 6,087,296 | (25) 1,581,582 | (27) 10,333,307 | (23) 278,900,462 | (18) 8,249,106 | (23) 287,149,568 |
| 1927..... | (28) 1,678,094 | (28) 7,149,561 | (28) 1,598,465 | (28) 10,426,120 | (16) 145,202,942 | (9) 3,036,904 | (16) 148,239,846 |
| 1928..... | (28) 1,751,569 | (28) 8,483,413 | (28) 1,686,589 | (28) 11,921,901 | (27) 279,674,261 | (18) 8,741,163 | (27) 288,415,424 |

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¹ Including some animals sold for yard traders.² Including sales for yard traders.

TABLE 556.—*Freight tonnage originating on railways in the United States, 1922-1928*¹

| Commodity | Calendar year | | | | | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
| FARM PRODUCTS | | | | | | | |
| Animals and animal products: | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons |
| Animals, live— | | | | | | | |
| Horses and mules..... | 491 | 603 | 531 | 544 | 513 | 541 | 577 |
| Cattle and calves..... | 9,567 | 9,400 | 9,316 | 9,330 | 9,241 | 8,636 | 7,976 |
| Sheep and goats..... | 1,159 | 1,159 | 1,215 | 1,224 | 1,270 | 1,296 | 1,362 |
| Hogs..... | 5,795 | 6,944 | 6,707 | 5,502 | 5,271 | 5,369 | 5,871 |
| Packing-house products— | | | | | | | |
| Fresh meats..... | 2,614 | 3,023 | 3,001 | 2,904 | 2,996 | 2,986 | 2,935 |
| Hides and leather..... | 1,081 | 1,090 | 1,025 | 1,026 | 984 | 1,010 | 914 |
| Other packing-house products..... | 2,049 | 2,397 | 2,395 | 2,140 | 2,023 | 1,957 | 1,461 |
| Total packing-house products..... | 5,744 | 6,510 | 6,421 | 6,070 | 6,003 | 5,953 | 5,310 |
| Eggs..... | 565 | 597 | 572 | 591 | 644 | 651 | 635 |
| Butter and cheese..... | 507 | 571 | 649 | 686 | 725 | 747 | 754 |
| Poultry..... | 292 | 366 | 376 | 357 | 408 | 407 | 407 |
| Wool..... | 360 | 291 | 294 | 263 | 281 | 356 | 394 |
| Other animals and products..... | 1,750 | 1,814 | 1,668 | 1,758 | 1,888 | 2,054 | 2,348 |
| Total animals and animal products..... | 26,230 | 28,255 | 27,749 | 26,325 | 26,244 | 26,010 | 25,634 |
| Vegetable products: | | | | | | | |
| Cotton..... | 3,074 | 2,887 | 3,261 | 4,127 | 4,482 | 4,182 | 3,772 |
| Fruits and vegetables..... | 9,683 | 10,398 | 10,868 | 11,634 | 12,223 | 12,020 | 12,947 |
| Potatoes..... | 4,829 | 4,698 | 4,590 | 4,614 | 4,339 | 4,728 | 4,511 |
| Grain and grain products— | | | | | | | |
| Grain— | | | | | | | |
| Wheat..... | 24,805 | 23,091 | 27,442 | 21,548 | 24,370 | 26,237 | 26,950 |
| Corn..... | 19,275 | 15,151 | 14,883 | 12,680 | 13,924 | 13,162 | 17,045 |
| Oats..... | 7,646 | 8,332 | 8,507 | 8,450 | 6,496 | 5,518 | 5,888 |
| Other grain..... | 5,245 | 4,739 | 5,616 | 4,564 | 4,014 | 5,216 | 5,506 |
| Grain products— | | | | | | | |
| Flour and meal..... | 10,694 | 10,518 | 10,330 | 9,901 | 10,137 | 10,027 | 10,754 |
| Other mill products..... | 9,000 | 10,002 | 10,083 | 9,578 | 9,768 | 10,179 | 10,580 |
| Total grain and grain products..... | 76,665 | 71,833 | 76,861 | 66,721 | 68,718 | 70,339 | 76,723 |
| Hay, straw, and alfalfa..... | 5,723 | 5,965 | 5,802 | 5,506 | 5,028 | 4,468 | 3,999 |
| Sugar, sirup glucose, and molasses..... | 5,091 | 4,891 | 5,356 | 5,700 | 5,744 | 5,584 | 5,604 |
| Tobacco..... | 882 | 1,090 | 1,069 | 1,038 | 1,010 | 1,053 | 945 |
| Other vegetable products..... | 11,868 | 13,406 | 15,277 | 17,118 | 17,609 | 18,469 | 16,686 |
| Total vegetable products..... | 117,815 | 115,177 | 123,084 | 116,458 | 119,153 | 120,852 | 125,187 |
| Canned goods (food products)..... | 3,106 | 3,435 | 3,731 | 4,144 | 4,070 | 4,204 | 4,805 |
| Total farm products..... | 147,151 | 146,867 | 154,564 | 146,927 | 149,467 | 151,066 | 155,626 |
| OTHER FREIGHT | | | | | | | |
| Products of mines..... | 532,996 | 713,735 | 638,520 | 678,336 | 758,064 | 713,731 | 696,583 |
| Products of forests..... | 89,059 | 115,618 | 108,090 | 107,391 | 104,859 | 99,391 | 96,737 |
| Manufactures..... | 211,308 | 258,471 | 246,432 | 274,001 | 284,640 | 279,407 | 300,043 |
| Merchandise, all l. c. l. freight..... | 43,229 | 44,339 | 40,551 | 40,587 | 39,498 | 38,432 | 36,954 |
| Total tonnage..... | 1,023,745 | 1,279,030 | 1,188,157 | 1,247,242 | 1,336,528 | 1,282,027 | 1,285,943 |

Bureau of Agricultural Economics. Compiled from reports of the Interstate Commerce Commission. Figures for earlier years appear in previous issues of the Yearbook.

¹ Freight tonnage as delivered at original shipping point.

TABLE 557.—*Index numbers of freight rates on livestock, wheat, and cotton, 1913-1928*

| Year beginning July 1 | Livestock | | | | | | |
|-------------------------|------------------|------------------|-------------------|---------------|------------------|------------------|---------------|
| | Cattle | | | | Hogs | | |
| | Western district | Eastern district | Southern district | United States | Western district | Eastern district | United States |
| 1913..... | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1914..... | 100 | 104 | 100 | 100 | 99 | 102 | 100 |
| 1915..... | 100 | 108 | 99 | 101 | 99 | 107 | 101 |
| 1916..... | 100 | 113 | 98 | 102 | 99 | 116 | 102 |
| 1917..... | 101 | 116 | 98 | 103 | 100 | 122 | 104 |
| 1918..... | 126 | 158 | 120 | 129 | 124 | 169 | 132 |
| 1919..... | 128 | 157 | 120 | 131 | 124 | 169 | 132 |
| 1920..... | 166 | 207 | 148 | 170 | 161 | 222 | 172 |
| 1921..... | 165 | 211 | 147 | 170 | 160 | 230 | 173 |
| 1922..... | 156 | 197 | 137 | 160 | 153 | 218 | 164 |
| 1923..... | 155 | 201 | 136 | 160 | 153 | 217 | 164 |
| 1924..... | 153 | 199 | 136 | 159 | 151 | 214 | 163 |
| 1925..... | 153 | 199 | 136 | 158 | 150 | 214 | 161 |
| 1926..... | 153 | 199 | 136 | 158 | 150 | 214 | 161 |
| 1927..... | 152 | 190 | 136 | 157 | 150 | 214 | 161 |
| 1928 ¹ | 152 | 198 | 136 | 157 | 150 | 211 | 161 |

| Year beginning July 1 | Livestock --Continued | | | | Wheat | | | | Cotton |
|-----------------------|-----------------------|------------------|---------------|-------|--------|---------|--------|-------------|--------|
| | Sheep | | | Total | Spring | Western | Winter | All wheat 1 | |
| | Western district | Eastern district | United States | | | | | | |
| 1913.. | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1914.. | 99 | 102 | 99 | 100 | 100 | 100 | 101 | 101 | 100 |
| 1915.. | 98 | 105 | 99 | 101 | 101 | 100 | 100 | 100 | 100 |
| 1916.. | 98 | 112 | 100 | 102 | 101 | 100 | 101 | 101 | 100 |
| 1917.. | 99 | 129 | 103 | 103 | 101 | 100 | 101 | 101 | 103 |
| 1918.. | 118 | 167 | 126 | 130 | 127 | 126 | 129 | 128 | 133 |
| 1919.. | 119 | 167 | 127 | 131 | 127 | 126 | 128 | 128 | 136 |
| 1920.. | 152 | 225 | 164 | 170 | 164 | 154 | 166 | 164 | 172 |
| 1921.. | 148 | 226 | 160 | 170 | 160 | 148 | 162 | 160 | 176 |
| 1922.. | 137 | 199 | 147 | 160 | 149 | 140 | 152 | 150 | 164 |
| 1923.. | 137 | 200 | 147 | 160 | 149 | 140 | 152 | 150 | 164 |
| 1924.. | 137 | 200 | 146 | 158 | 149 | 140 | 152 | 150 | 166 |
| 1925.. | 135 | 200 | 145 | 157 | 148 | 140 | 152 | 150 | 166 |
| 1926.. | 134 | 200 | 144 | 157 | 148 | 140 | 152 | 150 | 166 |
| 1927.. | 134 | 200 | 144 | 157 | 148 | 140 | 151 | 149 | 165 |
| 1928 1 | 134 | 196 | 144 | 157 | 148 | 140 | 149 | 148 | 164 |

Bureau of Agricultural Economics. These relatives are based on the average of the monthly rates in effect during the crop year. Rates in effect in 1913=100. For points of origin and destination, see Yearbook, 1926, pp. 1248-1249.

¹ Based on rates in effect to Dec. 31, 1928.

² Index for spring, western, and winter wheat weighted respectively 2, 1, and 5. Weight based on average production, 1923-1927.

GENERAL NOTE.—Tables similar to Table 523, 1927 Yearbook, index numbers of cotton freight rates, by origin and destination, and Table 525, ocean freight rates, are omitted.

TABLE 558.—*Fertilizer and fertilizer materials: Production and value in the United States, 1926-1928*

| Item | Quantity | | | Value | | |
|--|-------------------|-------------------|-------------------|----------------|----------------|----------------|
| | 1926 | 1927 | 1928 | 1926 | 1927 | 1928 |
| | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| Fish scrap, dried and acidulated..... | 46,992 | 44,403 | 40,089 | | | |
| Lime sold for agricultural purposes ¹ | 297,010 | 322,893 | 333,910 | 2,153,233 | 2,237,871 | 2,287,558 |
| Lime, calcareous marl and peat for fertilizer: | | | | | | |
| Calcareous marl, sold..... | 55,060 | 52,962 | | 146,094 | 180,166 | |
| Hydrated lime, sold..... | 184,293 | 215,027 | | 1,465,572 | 1,622,082 | |
| Limestone, pulverized, sold..... | 1,850,620 | 2,206,470 | | 3,064,235 | 3,360,704 | |
| Peat produced ² | 61,936 | | | 364,413 | | |
| Total..... | 2,151,909 | | | 5,040,314 | | |
| Phosphate rock sold or used: | | | | | | |
| Florida— | <i>Long tons</i> | <i>Long tons</i> | <i>Long tons</i> | | | |
| Hard rock..... | 116,264 | 131,254 | 92,627 | 465,308 | 525,016 | 370,508 |
| Land pebble..... | 2,591,943 | 2,506,166 | 2,729,334 | 8,218,200 | 8,121,146 | 8,953,798 |
| Total..... | 2,708,207 | 2,637,420 | 2,821,961 | 8,683,508 | 8,646,162 | 9,324,306 |
| Tennessee and Kentucky— | | | | | | |
| Brown and blue rock..... | 464,192 | 477,172 | 577,095 | 2,048,272 | 2,300,296 | 2,853,237 |
| Other States..... | 37,577 | 51,510 | 40,865 | 162,020 | 288,405 | 162,307 |
| Total phosphate rock..... | 3,209,976 | 3,166,102 | 3,439,921 | 10,893,800 | 11,234,863 | 12,339,850 |
| Sulphur produced..... | 1,890,027 | 2,111,618 | 1,981,873 | | | |
| Pyrites produced..... | 166,559 | 215,786 | 182,049 | 616,668 | 804,006 | 605,459 |

Bureau of Agricultural Economics. Compiled from annual reports of the American Fertilizer Handbook and the Bureau of Mines. Figures for earlier years appear in previous issues of the Yearbook.

¹ Porto Rico and Hawaii included.

² Production for all purposes.

³ Tennessee only.

TABLE 559.—*Fertilizer and fertilizer materials: Production, consumption, imports, and exports, United States, 1924-1928*

| Item | 1924 | 1925 | 1926 | 1927 | 1928 ¹ |
|--|-------------------|-------------------|-------------------|--------------------------|------------------------------|
| Sulphate of ammonia: | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> |
| Production ² | 544, 622 | 639, 019 | 690, 976 | 717, 460 | 748, 909 |
| Sales ³ | 660, 906 | 604, 457 | 682, 967 | ..... | ..... |
| Imports for consumption..... | 6, 720 | 26, 613 | 9, 392 | 19, 211 | ⁴ 47, 114 |
| Exports..... | 132, 571 | 137, 918 | 202, 860 | 155, 335 | 104, 177 |
| Nitrate of soda, imports for consumption..... | 1, 105, 035 | 1, 245, 693 | 1, 024, 009 | 838, 636 | ⁵ 1, 156, 860 |
| Sulphuric acid: | | | | | |
| Production (50° Baumé)..... | 1, 576, 544 | 1, 979, 292 | 1, 745, 759 | 1, 656, 871 | 2, 126, 860 |
| Imports for consumption..... | 7, 734 | 18, 191 | 27, 969 | 17, 434 | ⁶ 13, 164 |
| Exports..... | 5, 636 | 3, 769 | 4, 612 | 3, 756 | 3, 501 |
| Made and consumed ⁴ | 1, 782, 816 | 1, 316, 316 | 2, 058, 683 | 2, 137, 129 | 2, 440, 121 |
| Superphosphate: | | | | | |
| Production ⁴ | 3, 250, 498 | 3, 846, 401 | 3, 799, 054 | ⁶ 3, 699, 579 | 5, 505, 900 |
| Sales ⁴ | 3, 381, 202 | 3, 550, 762 | 3, 536, 552 | 1, 915, 913 | 1, 284, 499 |
| Potash: | | | | | |
| Production, domestic..... | 43, 719 | 51, 565 | 46, 324 | 76, 819 | 104, 129 |
| Sales, domestic..... | 37, 492 | 52, 823 | 51, 369 | 94, 722 | 105, 208 |
| Imports for consumption— | | | | | |
| Kainit..... | 175, 513 | 204, 767 | 203, 702 | 115, 345 | ⁷ 119, 897 |
| Manure salts..... | 258, 998 | 430, 340 | 354, 413 | 311, 357 | ⁸ 453, 242 |
| Muriate of potash..... | 144, 623 | 180, 351 | 223, 049 | 183, 475 | ⁸ 261, 644 |
| Sulphate of potash..... | 84, 780 | 77, 226 | 78, 258 | 77, 172 | ⁸ 96, 833 |
| Other potash bearing substances ⁹ | 46, 946 | 29, 002 | 52, 357 | 10, 531 | ⁸ 12, 047 |
| Total imports for consumption..... | 710, 860 | 921, 686 | 911, 779 | 697, 880 | ⁸ 943, 663 |

Bureau of Agricultural Economics. Compiled from annual reports of the Bureau of the Census, Bureau of Foreign and Domestic Commerce and the Bureau of Mines.

¹ Subject to revision.

² By-product of coke ovens. Production from other sources (coal gas, bone carbonizing, etc.) accounted for less than 5 per cent of the total production for these years.

³ General imports.

⁴ Fertilizer establishments only.

⁵ Bulk superphosphate and superphosphate for mixed fertilizers.

⁶ Bulk superphosphate.

⁷ Quantity sold as superphosphate or used in manufactured goods sold.

⁸ Includes ashes (wood), beet root, other potash bearing substances (alunite, leucite, etc.) used for fertilizer.

TABLE 560.—*Nitrogen: World production and consumption, year ended May, 1928*

| Item | Production | | Utilization | | |
|-------------------------------|--------------------|-----------------------------|---------------------|-------------------|--------------------|
| | Quantity | Percent- age of total | In agricul- ture | In industry | Total |
| | <i>Short tons</i> | <i>Per cent</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> |
| By-product ammonia..... | 430, 600 | 23. 6 | ..... | ..... | ..... |
| Chilean nitrate..... | 429, 000 | 23. 6 | ..... | ..... | ..... |
| Arc process..... | 33, 000 | 1. 8 | ..... | ..... | ..... |
| Cyanamide process..... | 250, 000 | 13. 7 | ..... | ..... | ..... |
| Direct synthetic ammonia..... | 680, 000 | 37. 3 | | | |
| Total..... | 1, 822, 600 | 100. 0 | 1, 593, 240 | 167, 000 | 1, 762, 240 |

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TABLE 561.—*Nitrogenous materials: Production and imports, United States, 1900–1928*

| Year | Production | | | Imports | | | | | | | | |
|-----------|--------------------|--------------------------|------------------|------------------|------------------|------------------|------------------|-------------------|------------------|------------------|--------------------------|------------------|
| | By-product ammonia | Air nitrogen (estimated) | Total | Chilean nitrate | Ammonium sulfate | Cyanamide | Calcium nitrate | Ammonium chloride | Ammonium nitrate | Sodium cyanide | Ammonium sulfate-nitrate | Total nitrogen |
| | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons |
| 1900..... | | | | 217 | 11 | | | | | | | |
| 1901..... | | | | 222 | 12 | | | | | | | |
| 1902..... | 7 | | 7 | 225 | 11 | | | | | | | |
| 1903..... | 8 | | 8 | 256 | 9 | | | | | | | |
| 1904..... | 11 | | 11 | 255 | 11 | | | | | | | |
| 1905..... | 13 | | 13 | 360 | 5 | | | | | | | |
| 1906..... | 15 | | 15 | 417 | 15 | | | | | | | |
| 1907..... | 20 | | 20 | 408 | 28 | | | | | | | |
| 1908..... | 17 | | 17 | 348 | 32 | | | | | | | |
| 1909..... | 23 | | 23 | 473 | 43 | | | | | | | |
| 1910..... | 23 | | 23 | 593 | 92 | 3 | | | | | | |
| 1911..... | 25 | | 25 | 610 | 96 | 6 | | | | | | |
| 1912..... | 29 | | 29 | 545 | 60 | 12 | | | | | | |
| 1913..... | 39 | | 39 | 701 | 65 | 30 | | | | | | |
| 1914..... | 38 | | 38 | 607 | 83 | 24 | | | | | | |
| 1915..... | 46 | | 46 | 865 | 36 | 34 | | | | | | |
| 1916..... | 59 | | 59 | 1,365 | 15 | 32 | | | | | | |
| 1917..... | 67 | | 67 | 1,728 | 8 | 53 | | | | | | |
| 1918..... | 78 | | 78 | 2,066 | 3 | 51 | | | | | | |
| 1919..... | 85 | (¹) | 85 | 456 | 3 | 70 | | | | | | |
| 1920..... | 104 | (¹) | 104 | 1,481 | 2 | 80 | | | | | | |
| 1921..... | 74 | (¹) | 74 | 413 | 5 | 19 | | | | | | |
| 1922..... | 97 | 1 | 98 | 608 | 5 | 43 | | | | | | |
| 1923..... | 123 | 6 | 129 | 999 | 4 | 77 | 10 | 3 | 10 | | | 177 |
| 1924..... | 117 | 11 | 128 | 1,105 | 7 | 85 | 9 | 5 | 2 | | | 191 |
| 1925..... | 136 | 13 | 149 | 1,246 | 27 | 109 | 9 | 5 | 5 | 17 | | 229 |
| 1926..... | 146 | 14 | 160 | 1,024 | 9 | 99 | 15 | 8 | 4 | 14 | | 189 |
| 1927..... | 152 | 18 | 170 | 839 | 19 | 123 | 20 | 7 | 6 | 16 | 50 | 182 |
| 1928..... | 170 | 26 | 196 | 1,157 | 47 | 152 | 26 | 6 | 7 | 19 | 92 | 255 |

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¹ Not over 500 tons.TABLE 562.—*Nitrogen: Production, imports, exports, and consumption, United States, 1923–1928*

| Item | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 |
|---|------------------|------------------|------------------|------------------|------------------|------------------|
| | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons | 1,000 short tons |
| Production..... | 129 | 128 | 149 | 160 | 170 | 196 |
| Imports..... | 177 | 191 | 229 | 189 | 182 | 255 |
| Total..... | 306 | 319 | 378 | 349 | 352 | 451 |
| Exports..... | 40 | 32 | 32 | 48 | 44 | 36 |
| Remaining for consumption..... | 266 | 287 | 346 | 301 | 308 | 415 |
| Percentage domestic production is of total. | Per cent 49.5 | Per cent 44.5 | Per cent 43.3 | Per cent 53.0 | Per cent 55.0 | Per cent 47.0 |

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MISCELLANEOUS AGRICULTURAL STATISTICS

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TABLE 563.—Fertilizer: Quantity consumed by States, 1923-1929

COMMERCIAL FERTILIZER

| State | Year ended | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|-----------------------------------|------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> |
| Maine..... | Dec. 31 | 168,000 | 182,000 | 185,000 | 147,000 | 183,750 | 178,750 | ..... |
| New Hampshire..... | June 30 | 17,000 | 16,000 | 16,000 | 14,680 | 16,875 | 16,900 | ..... |
| Vermont..... | do. | 18,000 | 17,000 | 18,000 | 18,000 | 15,663 | 16,911 | ..... |
| Massachusetts..... | do. | 63,709 | 61,968 | 62,656 | 58,920 | 71,734 | 70,458 | ..... |
| Rhode Island..... | Mar. 31 | 9,000 | 8,800 | 9,000 | 8,100 | 10,125 | 10,100 | ..... |
| Connecticut..... | Dec. 31 | 70,000 | 70,000 | 70,000 | 70,000 | 65,000 | 72,000 | ..... |
| New York..... | do. | 250,000 | 250,000 | 253,000 | 234,000 | 260,000 | 260,000 | ..... |
| New Jersey..... | Oct. 31 | 157,497 | 152,827 | 146,687 | 135,141 | 141,635 | 143,574 | ..... |
| Pennsylvania..... | do. | 308,742 | 319,685 | 326,121 | 328,904 | 326,514 | 328,500 | ..... |
| North Atlantic..... | | 1,061,948 | 1,078,280 | 1,086,464 | 1,014,745 | 1,091,206 | 1,097,193 | ..... |
| Ohio..... | Dec. 31 | 303,120 | 321,287 | 321,960 | 304,480 | 312,703 | 320,866 | ..... |
| Indiana..... | do. | 198,581 | 192,417 | 226,148 | 228,280 | 210,498 | 223,772 | ..... |
| Illinois..... | do. | 16,719 | 17,527 | 24,582 | 25,227 | 26,000 | 30,509 | ..... |
| Michigan..... | do. | 83,645 | 91,575 | 109,327 | 105,011 | 117,227 | 124,000 | ..... |
| Wisconsin..... | do. | 15,000 | 15,000 | 12,500 | 16,000 | 22,520 | 33,041 | ..... |
| Minnesota..... | do. | 4,560 | 4,450 | 5,000 | 11,316 | 11,172 | 10,100 | ..... |
| Iowa..... | do. | 4,000 | 4,500 | 6,000 | 6,021 | 7,181 | 10,000 | ..... |
| Missouri..... | do. | 51,597 | 47,121 | 63,939 | 56,831 | 56,100 | 64,922 | ..... |
| North Dakota..... | do. | 150 | 200 | 225 | 250 | 398 | 450 | ..... |
| South Dakota..... | do. | 150 | 150 | 150 | 150 | 200 | 220 | ..... |
| Nebraska..... | do. | 500 | 500 | 500 | 500 | 500 | 500 | ..... |
| Kansas..... | do. | 4,600 | 4,500 | 4,138 | 7,746 | 7,800 | 9,162 | ..... |
| North Central..... | | 682,562 | 702,227 | 774,469 | 761,875 | 802,299 | 827,542 | ..... |
| Delaware..... | Dec. 31 | 36,931 | 36,224 | 41,006 | 43,084 | 41,126 | 37,893 | ..... |
| Maryland..... | do. | 155,168 | 151,211 | 165,474 | 163,285 | 165,174 | 173,159 | ..... |
| Virginia..... | do. | 422,350 | 441,805 | 451,656 | 435,223 | 408,158 | 336,173 | 330,453 |
| West Virginia..... | do. | 40,000 | 40,000 | 41,000 | 43,209 | 43,200 | 44,900 | ..... |
| North Carolina ¹ | June 30 | 1,081,813 | 1,189,316 | 1,217,468 | 1,213,178 | 1,141,019 | 1,378,348 | 1,305,034 |
| South Carolina ¹ | do. | 678,795 | 879,093 | 866,377 | 840,955 | 720,393 | 817,548 | 760,085 |
| Georgia ¹ | do. | 677,040 | 688,783 | 770,889 | 760,643 | 705,053 | 898,405 | 870,300 |
| Florida ¹ | May 31 | 378,885 | 386,521 | 361,849 | 355,373 | 402,842 | 463,000 | 449,000 |
| South Atlantic..... | | 3,470,982 | 3,813,043 | 3,915,719 | 3,854,950 | 3,620,968 | 4,149,426 | ..... |
| Kentucky..... | Dec. 31 | 90,000 | 85,000 | 93,000 | 91,500 | 70,500 | 90,500 | ..... |
| Tennessee ¹ | May 31 | 105,417 | 135,270 | 155,248 | 135,257 | 115,973 | 156,956 | 148,643 |
| Alabama ¹ | Sept. 30 | 436,786 | 472,269 | 580,000 | 603,444 | 468,683 | 690,267 | 671,950 |
| Mississippi ¹ | do. | 215,854 | 213,516 | 257,763 | 280,850 | 212,562 | 316,893 | 335,500 |
| Arkansas ¹ | do. | 74,774 | 89,119 | 122,742 | 103,631 | 64,192 | 103,880 | 117,669 |
| Louisiana ¹ | Aug. 31 | 108,712 | 129,288 | 103,989 | 116,019 | 91,096 | 132,002 | 166,898 |
| Oklahoma ¹ | June 30 | 3,600 | 4,000 | 5,000 | 5,418 | 4,263 | 4,860 | ..... |
| Texas ¹ | Aug. 31 | 76,223 | 126,592 | 103,416 | 123,990 | 79,560 | 137,567 | 193,576 |
| South Central..... | | 1,111,366 | 1,255,045 | 1,421,158 | 1,460,479 | 1,106,823 | 1,636,325 | ..... |
| Montana..... | Dec. 31 | 100 | 100 | 90 | 90 | 90 | 100 | ..... |
| Idaho..... | June 30 | 400 | 400 | 400 | 420 | 450 | 450 | ..... |
| Wyoming..... | Dec. 31 | 100 | 100 | 100 | 100 | 100 | 100 | ..... |
| Colorado..... | do. | 250 | 250 | 250 | 337 | 607 | 728 | ..... |
| New Mexico..... | do. | 450 | 500 | 800 | 1,566 | 1,256 | 1,400 | ..... |
| Arizona..... | do. | 500 | 500 | 500 | 500 | 700 | 1,000 | ..... |
| Utah..... | do. | 500 | 500 | 500 | 500 | 500 | 500 | ..... |
| Nevada..... | do. | 30 | 30 | 30 | 30 | 30 | 30 | ..... |
| Washington..... | do. | 10,000 | 11,000 | 12,000 | 12,207 | 14,244 | 15,500 | ..... |
| Oregon..... | do. | 8,000 | 7,500 | 8,000 | 8,000 | 9,000 | 10,000 | ..... |
| California..... | do. | 71,819 | 66,274 | 85,933 | 93,845 | 102,524 | 116,942 | ..... |
| Far Western..... | | 92,149 | 87,151 | 108,603 | 117,595 | 126,501 | 146,750 | ..... |
| United States..... | | 6,419,007 | 6,935,749 | 7,306,413 | 7,209,644 | 6,759,887 | 7,857,236 | ..... |

COTTONSEED MEAL USED AS FERTILIZER⁶

| | | | | | | | | |
|-----------------------------------|----------|---------|---------|---------|---------|---------|---------|--------|
| North Carolina ¹ | June 30 | 108,772 | 117,626 | 109,029 | 150,377 | 176,476 | 112,165 | 99,354 |
| Mississippi ² | Sept. 30 | 41,867 | 49,923 | 62,090 | 71,937 | 98,562 | 51,015 | 50,760 |

Bureau of Agricultural Economics. Figures for cotton States based on sales of fertilizer tags as noted. Data for States other than cotton States compiled from reports of the National Fertilizer Association quoting figures from surveys, private estimates, and State records.

¹ Based on sales of fertilizer tags. Figures for earlier years appear in previous issues of the Yearbook.

² To July 1.

³ To June 1.

⁴ To May 1.

⁵ Calendar year.

⁶ Not separately reported except for North Carolina and Mississippi.

TABLE 564.—*Fertilizer used on cotton, 1927-1929*

| State | Acreage in cotton | | | | | |
|---------------------|-------------------|-------------|-------------|-------------|-------------|-------------|
| | July 1 | | | Fertilized | | |
| | 1927 ¹ | 1928 | 1929 | 1927 | 1928 | 1929 |
| | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres | 1,000 acres |
| Missouri..... | 305 | 355 | 350 | 15 | 18 | 18 |
| Virginia..... | 65 | 81 | 89 | 62 | 79 | 86 |
| North Carolina..... | 1,749 | 1,892 | 1,818 | 1,679 | 1,873 | 1,782 |
| South Carolina..... | 2,454 | 2,485 | 2,228 | 2,258 | 2,336 | 2,050 |
| Georgia..... | 3,501 | 3,883 | 3,847 | 3,291 | 3,728 | 3,693 |
| Florida..... | 67 | 101 | 97 | 56 | 87 | 81 |
| Tennessee..... | 985 | 1,145 | 1,137 | 473 | 698 | 682 |
| Alabama..... | 3,214 | 3,643 | 3,633 | 2,828 | 3,388 | 3,342 |
| Mississippi..... | 3,408 | 4,154 | 4,133 | 1,329 | 2,035 | 2,190 |
| Arkansas..... | 3,142 | 3,834 | 3,900 | 943 | 1,534 | 1,560 |
| Louisiana..... | 1,585 | 2,052 | 2,079 | 634 | 882 | 1,040 |
| Oklahoma..... | 4,187 | 4,420 | 4,655 | 21 | 44 | 93 |
| Texas..... | 16,850 | 18,330 | 18,912 | 421 | 1,100 | 1,324 |
| New Mexico..... | 100 | 123 | 132 | 1 | ..... | ..... |
| Arizona..... | 140 | 202 | 227 | ..... | ..... | ..... |
| California..... | 130 | 223 | 317 | ..... | ..... | ..... |
| All other..... | 23 | 23 | 15 | ..... | ..... | ..... |
| United States..... | 41,905 | 46,946 | 47,569 | 14,011 | 17,802 | 17,941 |

| State | Fertilizer used | | | | | |
|---------------------|------------------|--------|--------|------------|------------|------------|
| | Average per acre | | | Total | | |
| | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 |
| | Pounds | Pounds | Pounds | Short tons | Short tons | Short tons |
| Missouri..... | 125 | 125 | 140 | 1,938 | 1,125 | 1,260 |
| Virginia..... | 375 | 375 | 390 | 11,625 | 14,812 | 16,770 |
| North Carolina..... | 420 | 440 | 438 | 352,590 | 412,000 | 390,258 |
| South Carolina..... | 315 | 325 | 330 | 355,635 | 370,600 | 338,250 |
| Georgia..... | 247 | 260 | 265 | 406,438 | 484,640 | 489,322 |
| Florida..... | 215 | 255 | 240 | 6,020 | 11,092 | 9,720 |
| Tennessee..... | 206 | 216 | 218 | 48,719 | 75,384 | 74,358 |
| Alabama..... | 243 | 262 | 270 | 343,602 | 443,828 | 451,170 |
| Mississippi..... | 216 | 220 | 220 | 143,532 | 223,850 | 240,900 |
| Arkansas..... | 173 | 187 | 188 | 81,570 | 143,429 | 146,640 |
| Louisiana..... | 175 | 185 | 185 | 55,475 | 81,585 | 96,200 |
| Oklahoma..... | 145 | 190 | 180 | 1,522 | 4,180 | 8,370 |
| Texas..... | 185 | 197 | 185 | 38,942 | 108,350 | 122,470 |
| New Mexico..... | 165 | ..... | ..... | 82 | ..... | ..... |
| Arizona..... | ..... | ..... | ..... | ..... | ..... | ..... |
| California..... | ..... | ..... | ..... | ..... | ..... | ..... |
| All other..... | ..... | ..... | ..... | ..... | ..... | ..... |
| United States..... | 264 | 268 | 266 | 1,846,600 | 2,383,935 | 2,385,668 |

¹ Acreage in cotton June 25.

TABLE 564.—*Fertilizer used on cotton, 1927-1929—Continued*

| State | Value | | | | | | | | |
|---------------------|-----------------------|----------------|----------------|----------------------|----------------------|----------------------|------------------|----------------|----------------|
| | Average price per ton | | | Total | | | Average per acre | | |
| | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 | 1927 | 1928 | 1929 |
| | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>1,000 dollars</i> | <i>Dollars</i> | <i>Dollars</i> | <i>Dollars</i> |
| Missouri..... | 35.50 | 34.40 | 36.00 | 33 | 39 | 45 | 2.20 | 2.17 | 2.50 |
| Virginia..... | 24.00 | 28.30 | 27.30 | 279 | 419 | 458 | 4.50 | 5.30 | 5.33 |
| North Carolina..... | 24.00 | 29.00 | 28.00 | 8,462 | 11,950 | 10,927 | 5.04 | 6.38 | 6.13 |
| South Carolina..... | 22.00 | 27.30 | 26.90 | 7,824 | 10,363 | 9,099 | 3.47 | 4.44 | 4.44 |
| Georgia..... | 23.00 | 29.70 | 29.40 | 9,348 | 14,394 | 14,386 | 2.81 | 3.86 | 3.90 |
| Florida..... | 27.50 | 30.80 | 30.00 | 166 | 342 | 292 | 2.96 | 3.93 | 3.60 |
| Tennessee..... | 26.00 | 33.20 | 35.70 | 1,379 | 2,503 | 2,654 | 2.92 | 3.59 | 3.89 |
| Alabama..... | 26.00 | 32.20 | 31.50 | 8,934 | 14,291 | 14,212 | 3.16 | 4.22 | 4.25 |
| Mississippi..... | 32.30 | 32.50 | 38.00 | 4,636 | 8,171 | 9,154 | 3.49 | 4.02 | 4.18 |
| Arkansas..... | 31.50 | 37.00 | 37.00 | 2,569 | 5,307 | 5,426 | 2.72 | 3.46 | 3.48 |
| Louisiana..... | 34.00 | 39.30 | 39.10 | 1,886 | 3,206 | 3,761 | 2.97 | 3.63 | 3.62 |
| Oklahoma..... | 32.00 | 32.00 | 31.20 | 49 | 134 | 261 | 2.33 | 3.05 | 2.81 |
| Texas..... | 33.20 | 38.50 | 37.50 | 1,293 | 4,171 | 4,593 | 3.07 | 3.79 | 3.47 |
| New Mexico..... | 32.50 | | | 3 | | | 3.00 | | |
| Arizona..... | | | | | | | | | |
| California..... | | | | | | | | | |
| All other..... | | | | | | | | | |
| United States..... | 25.38 | 31.58 | 31.55 | 46,861 | 75,290 | 75,268 | 3.34 | 4.23 | 4.20 |

Bureau of Agricultural Economics. Based on returns from crop correspondents. Figures for earlier years appear in previous issues of the Yearbook.

TABLE 565.—*Insecticides and fungicides: Average wholesale price per pound, New York, 1919-1928*¹

| Year | Arsenic white | Calcium arsenate | Lead arsenate | | Paris green | Bordeaux mixture | | Lime-sulphur solution per gallon |
|-----------|---------------|------------------|---------------|--------------|--------------|------------------|--------------|----------------------------------|
| | | | Powder | Paste | | Powder | Paste | |
| | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> | <i>Cents</i> |
| 1910..... | 9.9 | | 29.9 | 14.9 | 35.8 | 16.5 | 12.4 | 19.1 |
| 1920..... | 13.8 | | 26.3 | 13.3 | 36.2 | 19.3 | 13.2 | 18.8 |
| 1921..... | 7.9 | 19.1 | 19.1 | 11.6 | 27.0 | 17.2 | 10.9 | 16.6 |
| 1922..... | 8.9 | 13.7 | 14.8 | 11.1 | 22.6 | 16.8 | 10.8 | 16.5 |
| 1923..... | 14.2 | 16.4 | 22.2 | 15.7 | 30.4 | 22.0 | 16.3 | 16.5 |
| 1924..... | 9.4 | 10.6 | 20.9 | 13.1 | 28.8 | 16.3 | 12.5 | 16.5 |
| 1925..... | 5.1 | 7.8 | 15.6 | 11.0 | 21.5 | 13.2 | 11.0 | 16.5 |
| 1926..... | 3.8 | 8.0 | 14.6 | 11.0 | 18.4 | 11.5 | 11.0 | 14.7 |
| 1927..... | 4.0 | 7.5 | 13.8 | | 19.2 | 11.5 | 11.0 | 15.5 |
| 1928..... | 4.4 | 6.8 | 14.1 | | 27.0 | 11.3 | 10.9 | 15.5 |

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter.

¹ Average of monthly range.

TABLE 566.—*Insecticides and fungicides: Production of certain arsenic compounds, and quantity of arsenic used in their manufacture, specified years*

| Year ended | Calcium arsenate | Lead arsenate | | Paris green | Arsenic (99 per cent prima white) used in the manufacture of— | | |
|--------------------|------------------|---------------|---------------|---------------|---|---------------|---------------|
| | | Powder | Paste | | Calcium arsenate | Lead arsenate | Paris green |
| | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> | <i>Pounds</i> |
| Dec. 31: | | | | | | | |
| 1919..... | 1,191,868 | 11,465,788 | | | | | |
| 1921..... | 2,419,684 | 9,229,701 | | | | | |
| 1923..... | 13,261,233 | 10,755,137 | | | | | |
| June 30: | | | | | | | |
| 1925..... | 19,911,262 | 13,523,902 | 341,580 | 3,544,887 | 7,702,069 | 3,932,644 | 2,441,540 |
| 1926..... | 5,363,320 | 16,573,784 | 324,430 | 2,863,691 | 2,111,782 | 5,384,193 | 2,255,069 |
| Aug. 31, 1927..... | 18,715,563 | 18,359,122 | 368,932 | 5,743,048 | 7,012,219 | 5,153,103 | 4,195,693 |

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census.

TABLE 567.—*Raw silk: Production in specified countries, average 1909-1913, 1921-1925, annual 1925-1928*

| Country | Average, 1909-1913 | Average, 1921-1925 | 1925 | 1926 | 1927 | 1928 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|---------------------------|
| WESTERN EUROPE | | | | | | |
| Italy..... | 1,000 pounds 8,524 | 1,000 pounds 9,487 | 1,000 pounds 9,656 | 1,000 pounds 8,499 | 1,000 pounds 10,201 | 1,000 pounds 10,662 |
| France..... | 992 | 548 | 573 | 529 | 650 | 452 |
| Spain..... | 182 | 177 | 221 | 187 | 183 | 174 |
| Total..... | 9,698 | 10,212 | 10,450 | 9,215 | 11,034 | 11,288 |
| Eastern Europe, Levant, and Central Asia ¹ | 6,611 | 1,874 | 2,524 | 2,359 | 2,293 | 2,513 |
| FAR EAST | | | | | | |
| China: | | | | | | |
| Exports from Shanghai..... | 12,576 | 10,456 | 12,599 | 12,225 | 13,283 | 14,154 |
| Exports from Canton..... | 5,146 | 6,418 | 6,923 | 7,055 | 5,809 | 6,162 |
| Japan: | | | | | | |
| Exports from Yokohama and Kobe ² | 21,898 | 46,336 | 56,978 | 66,193 | 68,839 | 74,075 |
| British India: | | | | | | |
| Exports from Bengal and Cashmere..... | 428 | 121 | 66 | 121 | 176 | 132 |
| Indo-China: | | | | | | |
| Exports from Saigon, Haiphong, etc..... | ³ 32 | 84 | 132 | 143 | 132 | 110 |
| Total..... | 40,080 | 63,415 | 76,698 | 85,737 | 88,239 | 94,632 |
| Grand total..... | 56,389 | 75,501 | 89,672 | 97,311 | 101,566 | 108,433 |

Bureau of Agricultural Economics. Compiled from Statistique de la Production de la Soie, Silk Merchants Union, Lyon, France.

¹ Includes Hungary, Czechoslovakia, Yugoslavia, Rumania, Bulgaria, Greece, Salonika, Adrianople Crete, the Caucasus, Turkestan, Central Asia, and Persia.

² Previous to 1923 only exports from Yokohama are included.

³ For years 1911-1913.

TABLE 568.—*Raw silk: Net imports, and price per pound, 1900-1928*

| Year ended Dec. 31 | Net imports ¹ | | Average price per pound ² | Year | Net imports ¹ | | Average price per pound ² |
|--------------------|--------------------------|------------|--|-----------|--------------------------|------------|--|
| | Total | Per capita | | | Total | Per capita | |
| | 1,000 pounds | Pound | Dollars | | 1,000 pounds | Pound | Dollars |
| 1900..... | 9,554 | 0.125 | 4.169 | 1915..... | 36,958 | 0.372 | 3.318 |
| 1901..... | 13,539 | .174 | 3.513 | 1916..... | 40,406 | .401 | 4.867 |
| 1902..... | 15,518 | .196 | 3.822 | 1917..... | 42,971 | .420 | 5.494 |
| 1903..... | 14,400 | .178 | 4.135 | 1918..... | 48,163 | .465 | 6.273 |
| 1904..... | 20,643 | .250 | 3.642 | 1919..... | 55,035 | .524 | 8.880 |
| 1905..... | 19,418 | .231 | 3.991 | 1920..... | 38,798 | .365 | 8.277 |
| 1906..... | 18,526 | .216 | 4.163 | 1921..... | 51,846 | .478 | 6.035 |
| 1907..... | 17,556 | .201 | 5.060 | 1922..... | 57,827 | .526 | 7.219 |
| 1908..... | 19,856 | .223 | 3.890 | 1923..... | 61,511 | .551 | 8.228 |
| 1909..... | 24,583 | .271 | 3.840 | 1924..... | 59,626 | .524 | 6.917 |
| 1910..... | 25,170 | .273 | 3.524 | 1925..... | 76,003 | .659 | 6.341 |
| 1911..... | 25,907 | .277 | 3.471 | 1926..... | 76,870 | .656 | 5.937 |
| 1912..... | 29,518 | .310 | 3.445 | 1927..... | 85,036 | .717 | 5.100 |
| 1913..... | 33,966 | .352 | 3.640 | 1928..... | 87,170 | .726 | 4.859 |
| 1914..... | 30,600 | .312 | 3.694 | | | | |

Bureau of Agricultural Economics. Compiled from December issues of "Monthly summary of Foreign Commerce of United States" prior to 1918. Subsequent years are from annual issues of "Commerce and Navigation of United States" of the Department of Commerce. Prices are from bulletins of the U. S. Bureau of Labor Statistics.

¹ Net imports are imports minus reexports.

² Monthly average of price per pound of Japanese Kansai, No. 1.

TABLE 569.—*Rayon, yarn: Production, net imports, amount available for consumption and price in the United States, 1911-1928*

| Year ended Dec. 31 | Produc- tion | Net im- ports ¹ | Available for consumption | | Average price per pound | |
|-------------------------|-----------------|-------------------------------|------------------------------|------------|------------------------------|------------------------------|
| | | | Total | Per capita | 150-A denier ² | 300-A denier ² |
| | 1,000 pounds | 1,000 pounds | 1,000 pounds | Pound | Dollars | Dollars |
| 1911..... | 320 | 823 | 1,143 | 0.012 | | |
| 1912..... | 1,120 | 1,549 | 2,669 | .028 | | |
| 1913..... | 1,566 | 2,298 | 3,864 | .040 | 1.850 | 1.700 |
| 1914..... | 2,445 | 2,918 | 5,363 | .055 | 1.963 | 1.813 |
| 1915..... | 4,111 | 2,707 | 6,818 | .069 | 2.125 | 1.975 |
| 1916..... | 5,744 | 860 | 6,604 | .066 | 3.113 | 2.950 |
| 1917..... | 6,697 | 546 | 7,243 | .071 | 3.863 | 3.650 |
| 1918..... | 5,828 | 66 | 5,894 | .057 | 4.396 | 4.146 |
| 1919..... | 8,174 | 1,147 | 9,321 | .089 | 4.767 | 4.517 |
| 1920..... | 10,240 | 1,799 | 12,039 | .113 | 4.663 | 4.413 |
| 1921..... | 15,000 | 3,419 | 18,419 | .170 | 2.671 | 2.479 |
| 1922..... | 24,406 | 2,993 | 27,399 | .249 | 2.800 | 2.650 |
| 1923..... | 36,477 | 6,515 | 42,992 | .385 | 2.800 | 2.650 |
| 1924..... | 37,720 | 6,569 | 44,289 | .389 | 2.113 | 1.871 |
| 1925..... | 51,902 | 12,363 | 64,265 | .557 | 2.004 | 1.754 |
| 1926..... | 63,648 | 13,918 | 77,566 | .662 | 1.810 | 1.603 |
| 1927..... | 75,555 | 17,740 | 93,295 | .786 | 1.489 | 1.289 |
| 1928 (preliminary)..... | 97,901 | 15,222 | 113,123 | .943 | 1.500 | 1.300 |

Bureau of Agricultural Economics. Compiled from December issues of "Monthly Summary of Foreign Commerce of United States" prior to 1918. Subsequent years are from annual issues of Commerce and Navigation of United States Department of Commerce. Production figures are from "Yearbook of the Department of Commerce." Prices are from Bulletins of the United States Bureau of Labor Statistics.

¹ Net imports are imports minus reexports, years 1911 through 1924; and imports minus exports and reexports, 1925-1928.

² The count indicates the number of deniers or one-half decigram units, in weight, of a standard length of 450 meters. Since the standard is based on an arbitrary fixed length and a variable weight, the finer the yarn the smaller the count; 150 denier count, a size commonly used, is fine and 300 denier count is coarse.

TABLE 570.—*Federal-aid highway system: Mileage, Federal-aid apportionment for fiscal year 1931, and total apportionment for years 1917 to 1931, inclusive*

| State | Mileage in ap- proved system June 30, 1929 | Apportion- ment for fiscal year 1931 | Aggregate of appor- tionment for fiscal years 1917 to 1931 inclusive | State | Mileage in ap- proved system June 30, 1929 | Apportion- ment for fiscal year 1931 | Aggregate of appor- tionment for fiscal years 1917 to 1931 inclusive |
|--------------------|---|---|--|---------------------|---|---|--|
| Alabama..... | 3,884.0 | 1,557,372 | 20,555,751 | New Hampshire..... | 960.9 | 365,625 | 4,631,962 |
| Arizona..... | 1,498.0 | 1,062,190 | 13,856,625 | New Jersey..... | 1,181.7 | 936,234 | 12,210,821 |
| Arkansas..... | 5,019.4 | 1,293,086 | 16,742,953 | New Mexico..... | 3,367.7 | 1,190,296 | 15,727,891 |
| California..... | 4,781.0 | 2,501,170 | 32,039,182 | New York..... | 5,451.0 | 3,905,965 | 48,534,004 |
| Colorado..... | 3,332.0 | 1,390,524 | 17,865,012 | North Carolina..... | 3,944.4 | 1,722,673 | 22,586,064 |
| Connecticut..... | 835.4 | 477,893 | 6,235,582 | North Dakota..... | 7,396.6 | 1,203,060 | 15,537,696 |
| Delaware..... | 485.9 | 365,625 | 3,936,558 | Ohio..... | 5,869.3 | 2,753,528 | 36,759,943 |
| Florida..... | 1,926.0 | 921,538 | 11,716,509 | Oklahoma..... | 5,594.3 | 1,751,015 | 20,060,616 |
| Georgia..... | 5,576.7 | 1,985,632 | 26,357,252 | Oregon..... | 3,239.7 | 3,314,707 | 44,648,863 |
| Idaho..... | 2,770.0 | 932,594 | 12,294,278 | Pennsylvania..... | 5,058.2 | 3,174,707 | 44,648,863 |
| Illinois..... | 6,618.5 | 3,100,781 | 42,341,582 | Rhode Island..... | 362.4 | 365,625 | 4,130,069 |
| Indiana..... | 4,701.5 | 1,999,505 | 25,879,131 | South Carolina..... | 3,230.0 | 1,065,105 | 14,042,597 |
| Iowa..... | 7,212.0 | 2,005,944 | 27,592,658 | South Dakota..... | 6,001.5 | 1,232,962 | 16,073,079 |
| Kansas..... | 7,917.0 | 2,048,585 | 27,702,029 | Tennessee..... | 3,252.8 | 1,608,802 | 21,725,833 |
| Kentucky..... | 3,710.0 | 1,414,610 | 18,884,029 | Texas..... | 11,691.0 | 4,545,830 | 58,683,271 |
| Louisiana..... | 2,712.9 | 1,040,195 | 13,371,889 | Utah..... | 1,686.3 | 850,752 | 11,213,122 |
| Maine..... | 1,443.6 | 675,106 | 9,180,660 | Vermont..... | 1,043.0 | 365,625 | 4,731,007 |
| Maryland..... | 1,557.1 | 631,911 | 8,460,608 | Virginia..... | 3,291.5 | 1,428,253 | 19,244,434 |
| Massachusetts..... | 1,308.0 | 1,090,022 | 14,466,733 | Washington..... | 2,927.5 | 1,156,219 | 14,726,242 |
| Michigan..... | 5,243.0 | 2,200,177 | 29,171,795 | West Virginia..... | 2,214.0 | 792,826 | 10,529,177 |
| Minnesota..... | 6,884.5 | 2,102,986 | 28,036,206 | Wisconsin..... | 5,493.4 | 1,849,169 | 24,877,281 |
| Mississippi..... | 3,032.1 | 1,323,897 | 17,380,914 | Wyoming..... | 3,067.0 | 942,455 | 12,322,131 |
| Missouri..... | 7,530.0 | 2,382,383 | 32,370,362 | Hawaii..... | 174.6 | 365,625 | 2,562,653 |
| Montana..... | 4,690.5 | 1,552,865 | 19,635,885 | | | | |
| Nebraska..... | 5,468.3 | 1,586,526 | 20,978,179 | | | | |
| Nevada..... | 1,541.0 | 960,845 | 12,622,940 | | | | |
| | | | | Total..... | 188,857.2 | 73,125,000 | 963,875,000 |

TABLE 571.—Current status of Federal-aid road construction as of June 30, 1929

| State | Com- pleted mileage | Under construction | | | Approved for construction | | | Balance of Federal-aid funds avail- able for new projects | | | |
|---------------------|---------------------------|-------------------------|-------------------------|---------|---------------------------|-------------------------|-------------------------|---|---------|---------|----------------|
| | | Estimated total cost | Federal aid allotted | Mileage | | Estimated total cost | Federal aid allotted | | Mileage | | |
| | | | | Initial | Stage 1 | | | | Total | Initial | Stage 1 | Total |
| Alabama..... | 1,960.7 | \$3,258,926.95 | \$1,027,437.04 | 224.7 | 21.0 | 245.7 | \$215,199.10 | 6.4 | 14.3 | 20.7 | \$2,243,381.25 |
| Arizona..... | 1,887.8 | 2,196,816.28 | 1,850,989.34 | 100.5 | 30.1 | 130.6 | 226,598.57 | 29.4 | 29.4 | 29.4 | 2,653,890.02 |
| Arkansas..... | 1,745.1 | 3,656,725.36 | 1,799,403.14 | 102.9 | 6.5 | 109.4 | 262,782.41 | 25.3 | 6.0 | 31.3 | 2,104,522.71 |
| California..... | 1,635.5 | 9,612,659.34 | 4,324,210.30 | 263.4 | 9.9 | 273.3 | 2,536,332.71 | 31.6 | 19.3 | 50.9 | 821,207.18 |
| Colorado..... | 1,137.4 | 3,993,906.55 | 2,068,568.40 | 128.8 | 26.6 | 155.4 | 1,117,206.50 | 25.8 | 12.4 | 38.2 | 1,673,794.83 |
| Connecticut..... | 229.3 | 792,275.72 | 217,937.99 | 12.5 | 15.7 | 28.2 | 412,855.91 | 8.0 | 8.0 | 8.0 | 558,722.80 |
| Delaware..... | 212.9 | 753,366.80 | 268,843.42 | 15.7 | 5.7 | 21.4 | 1,372,230.99 | 30.8 | 30.8 | 30.8 | 47,336.16 |
| Florida..... | 449.0 | 2,734,520.08 | 1,135,234.01 | 90.9 | 36.9 | 127.8 | 262,260.69 | 2.9 | 2.9 | 2.9 | 1,945,926.62 |
| Georgia..... | 2,564.7 | 3,757,898.66 | 1,673,267.89 | 163.9 | 5.7 | 169.6 | 18,192.86 | 16.3 | 16.3 | 16.3 | 2,018,492.49 |
| Idaho..... | 1,144.5 | 905,547.56 | 542,064.66 | 77.5 | 77.5 | 155.0 | 202,122.35 | 22.5 | 22.5 | 22.5 | 856,815.71 |
| Illinois..... | 1,888.6 | 19,245,292.23 | 8,620,190.39 | 572.8 | 77.5 | 650.3 | 648,000.00 | 35.3 | 35.3 | 35.3 | 2,642,000.00 |
| Indiana..... | 1,266.7 | 8,958,464.70 | 4,278,809.78 | 275.9 | 275.9 | 551.8 | 594,631.00 | 25.7 | 63.9 | 89.6 | 134,519.81 |
| Iowa..... | 3,006.1 | 3,527,407.02 | 1,582,909.17 | 53.4 | 82.3 | 135.7 | 1,058,051.61 | 25.7 | 11.5 | 37.2 | 1,144,315.96 |
| Kansas..... | 2,539.5 | 3,432,075.07 | 1,346,245.56 | 243.8 | 3.4 | 247.2 | 2,067,844.93 | 135.9 | 40.3 | 176.2 | 757,788.11 |
| Kentucky..... | 1,314.5 | 4,598,602.22 | 2,194,672.33 | 243.8 | 151.9 | 395.7 | 287,899.05 | 29.7 | 29.7 | 29.7 | 1,150,105.07 |
| Louisiana..... | 1,321.4 | 3,023,495.55 | 1,903,989.15 | 151.9 | 44.3 | 196.2 | 941,331.71 | 39.3 | 3.4 | 42.7 | 213,725.37 |
| Maine..... | 480.5 | 1,883,862.41 | 646,104.12 | 44.3 | 3.6 | 47.9 | 381,984.35 | 1.9 | 9.5 | 11.4 | 1,787,319.03 |
| Maryland..... | 627.9 | 1,071,810.00 | 62,360.00 | 3.6 | 91.1 | 94.7 | 980,200.95 | 51.6 | 16.8 | 68.4 | 1,424,179.67 |
| Massachusetts..... | 570.7 | 10,224,762.17 | 4,374,874.40 | 251.3 | 251.3 | 502.6 | 258,186.27 | 74.7 | 16.6 | 91.3 | 410,970.25 |
| Michigan..... | 1,470.2 | 4,886,903.63 | 1,671,618.27 | 197.6 | 93.4 | 291.0 | 933,716.86 | 12.9 | 91.4 | 104.3 | 3,613,781.84 |
| Minnesota..... | 3,872.6 | 4,736,236.26 | 2,130,632.99 | 196.4 | 17.4 | 213.8 | 146,146.56 | 16.5 | 91.4 | 107.9 | 1,361,556.02 |
| Mississippi..... | 2,278.1 | 9,068,176.63 | 3,483,757.97 | 211.8 | 56.2 | 268.0 | 3,242,376.38 | 166.0 | 166.0 | 166.0 | 2,539,681.66 |
| Missouri..... | 1,538.9 | 5,080,960.81 | 3,187,267.45 | 354.2 | 8.1 | 362.3 | 1,758,524.56 | 54.0 | 134.7 | 188.7 | 204,680.18 |
| Montana..... | 3,628.2 | 2,892,184.38 | 1,438,788.31 | 240.5 | 60.2 | 300.7 | 711,443.12 | 6.6 | 92.4 | 99.0 | 188,125.54 |
| Nebraska..... | 1,081.6 | 1,144,050.62 | 1,002,938.37 | 114.5 | 112.4 | 226.9 | 354,482.30 | 6.5 | 6.5 | 6.5 | 625,470.08 |
| Nevada..... | 332.7 | 561,177.02 | 168,533.31 | 12.5 | 13.5 | 26.0 | 97,410.00 | 8.7 | 8.7 | 8.7 | 1,153,455.48 |
| New Hampshire..... | 462.6 | 4,565,550.60 | 815,205.00 | 54.3 | 54.3 | 108.6 | 130,335.00 | 9.0 | 9.0 | 9.0 | 4,295,740.58 |
| New Jersey..... | 1,868.1 | 2,261,247.93 | 5,137,430.15 | 343.6 | 137.6 | 481.2 | 521,240.38 | 137.5 | 137.5 | 137.5 | 2,721,786.21 |
| New Mexico..... | 2,182.7 | 3,375,152.61 | 687,576.28 | 80.4 | 87.6 | 168.0 | 2,054,505.00 | 14.2 | 231.9 | 246.1 | 982,621.68 |
| New York..... | 1,712.0 | 3,234,518.96 | 1,329,006.06 | 482.5 | 7.2 | 489.7 | 131,967.67 | 59.7 | 19.3 | 79.0 | 2,755,365.68 |
| North Carolina..... | 3,675.8 | 11,976,028.49 | 4,206,990.80 | 257.2 | 138.2 | 395.4 | 426,101.68 | 38.4 | 17.1 | 55.5 | 1,430,698.62 |
| North Dakota..... | 2,013.1 | 1,496,896.94 | 668,725.70 | 78.8 | 5.8 | 84.6 | 617,562.37 | 72.9 | 44.8 | 117.7 | 548,347.68 |
| Ohio..... | 1,147.9 | 735,251.14 | 391,848.56 | 48.2 | 216.6 | 264.8 | 708,004.14 | 81.9 | 81.9 | 81.9 | 1,153,478.52 |
| Oregon..... | 2,072.9 | 12,554,654.57 | 3,395,873.25 | 202.5 | 14.1 | 216.6 | 1,267,978.20 | 1.5 | 1.5 | 1.5 | 886,699.53 |
| Pennsylvania..... | 1,615.2 | 1,592,040.96 | 823,426.61 | 23.9 | 37.4 | 61.3 | 22,755.00 | 49.0 | 28.6 | 77.6 | 371,556.94 |
| Rhode Island..... | 183.8 | 4,060,276.30 | 823,426.61 | 128.9 | 47.7 | 176.6 | 53,000.00 | 14.2 | 14.2 | 14.2 | 3,236,849.59 |
| South Carolina..... | 3,310.8 | 3,727,028.20 | 2,010,354.66 | 488.6 | 47.7 | 536.3 | 232,578.85 | 49.0 | 28.6 | 77.6 | 371,556.94 |

| | | | | | | | | | | | | |
|--------------------|-----------|-----------------|-----------------|----------|----------|----------|-----------------|-----------------|----------|----------|----------|-----------------|
| Tennessee..... | 1, 143.4 | 3, 605, 466.41 | 1, 672, 382.01 | 119.8 | 233.2 | 119.8 | 342, 937.22 | 171, 468.59 | 15.9 | 139.1 | 15.9 | 1, 066, 306.59 |
| Texas..... | 6, 064.2 | 17, 123, 807.68 | 7, 610, 635.50 | 657.9 | 911.1 | 911.1 | 7, 040, 086.00 | 2, 998, 213.00 | 173.2 | 312.3 | 173.2 | 36, 517.80 |
| Utah..... | 913.3 | 1, 727, 297.51 | 1, 165, 860.46 | 68.0 | 38.1 | 38.1 | 246, 969.73 | 182, 643.58 | 18.4 | 18.4 | 18.4 | 361, 621.97 |
| Vermont..... | 229.0 | 1, 889, 278.37 | 632, 504.02 | 33.1 | 18.9 | 18.9 | 70, 051.36 | 10, 025.68 | 22.1 | 3.1 | 22.1 | 62, 785.68 |
| Virginia..... | 1, 346.5 | 2, 754, 082.66 | 1, 196, 688.51 | 93.3 | 114.2 | 114.2 | 476, 187.64 | 230, 193.99 | 21.9 | 11.7 | 21.9 | 758, 318.82 |
| Washington..... | 854.4 | 3, 721, 579.95 | 1, 238, 875.25 | 73.1 | 18.1 | 18.1 | 1, 693, 326.63 | 480, 000.00 | 21.9 | 33.6 | 21.9 | 917, 100.03 |
| West Virginia..... | 683.3 | 2, 842, 654.78 | 1, 119, 762.08 | 68.9 | 17.8 | 17.8 | 1, 323, 937.44 | 515, 302.72 | 24.8 | 12.3 | 24.8 | 77, 371.86 |
| Wisconsin..... | 2, 050.1 | 9, 777, 590.68 | 4, 308, 468.14 | 307.1 | 29.3 | 306.4 | 734, 723.77 | 363, 097.16 | 38.9 | 56.1 | 38.9 | 338, 759.36 |
| Wyoming..... | 1, 674.6 | 1, 526, 197.61 | 979, 518.74 | 155.1 | 8.9 | 164.0 | 213, 573.07 | 147, 210.67 | 28.7 | 27.4 | 28.7 | 313, 862.60 |
| Hawaii..... | 39.5 | 402, 261.10 | 137, 426.82 | 6.6 | 6.6 | 6.6 | 562, 688.38 | 247, 239.61 | 16.6 | 16.6 | 16.6 | 1, 072, 664.16 |
| Total..... | 78, 096.6 | 38, 158, 495.57 | 96, 500, 346.96 | 8, 358.6 | 1, 167.7 | 9, 526.3 | 61, 500, 673.97 | 24, 137, 546.45 | 1, 833.0 | 2, 898.3 | 1, 833.0 | 56, 339, 874.64 |

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¹ The term stage construction refers to additional work done on projects previously improved with Federal aid. In general, such additional work, consists of the construction of a surface of higher type than was provided in the initial improvement.

TABLE 572.—*Mileage of roads in State highway systems at end of 1928, as reported by State highway departments*

| State | Total system mileage | Earth, non-surfaced | | Surfaced roads, by types | | | | | | | | |
|---------------------|----------------------|---------------------|-------------------|--------------------------|--------------------|---------------------|--|--------------------|---------------|---------------------|--------------------------|-----------------|
| | | Unimproved | Improved to grade | Total surfaced mileage | Sand-clay, topsoil | Gravel, chert, etc. | Waterbound macadam (treated and untreated) | Bituminous macadam | Sheet asphalt | Bituminous concrete | Portland cement concrete | Brick and block |
| Alabama..... | 5,590 | 2,450 | 400 | 2,740 | 800 | 1,468 | 46 | 63 | 6 | 118 | 239 | ..... |
| Arizona..... | 2,213 | 336 | 201 | 1,386 | 27 | 1,356 | ..... | ..... | 15 | 51 | 137 | ..... |
| Arkansas..... | 8,718 | 1,499 | 2,303 | 4,916 | ..... | 4,072 | 108 | 147 | 32 | 200 | 288 | ..... |
| California..... | 9,572 | 2,057 | 3,927 | ..... | ..... | 1,351 | 61 | 325 | 307 | 136 | 1,657 | ..... |
| Colorado..... | 9,129 | 4,223 | 742 | 4,155 | 82 | 3,730 | ..... | ..... | ..... | 13 | 330 | ..... |
| Connecticut..... | 2,013 | ..... | 107 | 1,906 | ..... | 319 | 774 | 208 | ..... | 152 | 392 | 1 |
| Delaware..... | 703 | ..... | ..... | 703 | ..... | 23 | 5 | 29 | ..... | 13 | 607 | 7 |
| Florida..... | 6,414 | 2,727 | 453 | 3,234 | 715 | 8 | 1,484 | 149 | 19 | 52 | 334 | 288 |
| Georgia..... | 6,253 | 2,156 | 321 | 3,776 | 1,844 | 772 | 171 | 274 | 116 | 17 | 581 | 1 |
| Idaho..... | 4,259 | 1,419 | 408 | 2,372 | 32 | 2,125 | ..... | ..... | 5 | 132 | 56 | ..... |
| Illinois..... | 4,889 | 3,363 | 274 | 6,252 | ..... | ..... | ..... | ..... | 4 | 6 | ..... | ..... |
| Indiana..... | 4,610 | ..... | 18 | 4,592 | ..... | 1,586 | 943 | 358 | ..... | 32 | 6,111 | 119 |
| Iowa..... | 7,184 | 899 | 1,114 | 5,171 | ..... | 3,423 | ..... | ..... | ..... | 1,697 | 82 | ..... |
| Kansas..... | 8,691 | 4,042 | 1,920 | 2,720 | 1,307 | 1,969 | 2,308 | 159 | ..... | 3 | 1,715 | 33 |
| Kentucky..... | 11,500 | 5,521 | 842 | 5,137 | ..... | 6,082 | ..... | 428 | ..... | 21 | 649 | 178 |
| Louisiana..... | 9,053 | 2,509 | 257 | 0,287 | ..... | 1,335 | 7 | 235 | 1 | 123 | 50 | 20 |
| Maine..... | 1,911 | 230 | ..... | 1,681 | 4 | 398 | ..... | ..... | ..... | 100 | ..... | ..... |
| Maryland..... | 2,656 | ..... | ..... | 2,656 | ..... | 91 | 1,131 | ..... | ..... | 53 | 1,030 | 1 |
| Massachusetts..... | 1,587 | ..... | 8 | 1,579 | ..... | 3,479 | 245 | 771 | 43 | 213 | 256 | 3 |
| Michigan..... | 7,613 | 730 | 104 | 6,770 | 96 | 6,208 | 569 | 128 | ..... | 260 | 2,221 | 11 |
| Minnesota..... | 6,947 | ..... | 331 | 6,616 | 281 | 4,071 | ..... | ..... | ..... | 77 | 936 | 24 |
| Mississippi..... | 6,939 | 1,794 | 609 | 4,536 | 1 | 4,071 | 11 | 51 | 8 | 14 | 360 | 30 |
| Missouri..... | 7,727 | 2,000 | 1,250 | 4,268 | ..... | 2,420 | ..... | 94 | ..... | 1,733 | 21 | ..... |
| Montana..... | 8,007 | 6,404 | 249 | 1,354 | ..... | 1,305 | ..... | 5 | ..... | 37 | ..... | ..... |
| Nebraska..... | 8,012 | 3,334 | 801 | 3,877 | 154 | 3,561 | ..... | ..... | 3 | 13 | 95 | 51 |
| Nevada..... | 3,554 | 1,092 | 131 | 1,431 | ..... | 1,231 | ..... | 147 | ..... | 2 | 51 | ..... |
| New Hampshire..... | 2,365 | 103 | 98 | 2,164 | ..... | 1,759 | 112 | 167 | ..... | 71 | 55 | ..... |
| New Jersey..... | 1,821 | 5 | 135 | 1,681 | ..... | 1,286 | 131 | 30 | 91 | 278 | 814 | 51 |
| New Mexico..... | 9,354 | 6,355 | 989 | 2,010 | ..... | 1,036 | ..... | ..... | ..... | 1 | 73 | ..... |
| New York..... | 13,917 | 3,331 | 25 | 10,561 | ..... | 1,26 | 1,988 | 3,704 | ..... | 265 | 4,115 | 273 |
| North Carolina..... | 7,137 | ..... | 747 | 6,390 | 2,252 | 359 | 205 | 458 | 66 | 854 | 2,155 | 41 |
| North Dakota..... | 7,205 | 3,342 | 1,618 | 2,245 | ..... | 2,235 | ..... | ..... | 1 | ..... | 9 | ..... |
| Ohio..... | 10,953 | 250 | 206 | 10,497 | ..... | 3,837 | 1,496 | 1,716 | 39 | 174 | 1,812 | 1,423 |
| Oklahoma..... | 6,142 | 2,737 | 1,410 | 1,995 | ..... | 939 | ..... | ..... | 21 | 187 | 812 | 30 |
| Oregon..... | 4,368 | 644 | 234 | 3,490 | ..... | 2,483 | ..... | 112 | ..... | 687 | 208 | ..... |
| Pennsylvania..... | 13,330 | ..... | 4,164 | 9,166 | ..... | 1,513 | 2,272 | 410 | 193 | 327 | 4,068 | 383 |
| Rhode Island..... | 920 | 225 | 183 | 512 | ..... | 23 | 116 | 157 | 11 | 115 | 90 | ..... |
| South Carolina..... | 5,810 | 1,642 | 111 | 4,657 | 3,322 | 529 | 38 | 11 | 136 | 179 | 442 | ..... |
| South Dakota..... | 5,975 | 995 | 1,567 | 3,413 | 20 | 3,378 | ..... | 6 | ..... | 9 | ..... | ..... |
| Tennessee..... | 6,870 | 940 | 396 | 4,534 | ..... | 2,133 | 1,225 | 596 | 35 | 80 | 465 | ..... |
| Texas..... | 18,728 | 6,855 | 1,124 | 10,749 | 237 | 6,122 | 521 | 2,405 | 17 | 223 | 1,141 | 83 |
| Utah..... | 3,458 | 591 | 1,224 | 1,643 | ..... | 1,291 | 68 | 5 | 12 | 52 | 215 | ..... |
| Vermont..... | 4,204 | 62 | 758 | 3,384 | 1,000 | 2,116 | 40 | 68 | ..... | 151 | ..... | ..... |
| Virginia..... | 6,932 | 1,655 | 555 | 4,722 | 1,279 | 845 | 1,206 | 713 | 10 | 3 | 698 | ..... |
| Washington..... | 3,262 | 334 | 194 | 2,734 | ..... | 1,983 | ..... | 32 | 2 | 43 | 662 | 12 |
| West Virginia..... | 3,826 | 568 | 860 | 2,392 | ..... | 703 | 149 | 723 | 1 | 90 | 585 | 141 |
| Wisconsin..... | 10,221 | 643 | 936 | 8,642 | 46 | 5,360 | 552 | 125 | 4 | 12 | 2,541 | 2 |
| Wyoming..... | 3,115 | 1,178 | 631 | 1,306 | ..... | 1,257 | ..... | ..... | ..... | 27 | 12 | ..... |
| Total, 1928..... | 306,442 | 81,549 | 31,755 | 193,138 | 13,499 | 93,124 | 18,142 | 15,200 | 1,498 | 5,392 | 42,957 | 3,326 |
| Total: | | | | | | | | | | | | |
| 1927..... | 293,353 | 86,817 | 29,970 | 176,566 | 12,581 | 86,095 | 17,752 | 13,496 | 1,332 | 5,066 | 36,915 | 3,329 |
| 1926..... | 287,928 | 96,413 | 28,456 | 163,059 | 11,396 | 79,296 | 15,428 | 12,927 | 890 | 4,815 | 31,936 | 3,381 |
| 1925..... | 274,911 | 103,271 | 26,798 | 144,854 | 11,025 | 68,771 | 10,709 | 12,105 | 853 | 4,561 | 27,643 | 3,185 |
| 1924..... | 261,216 | 94,651 | 34,456 | 132,109 | 10,446 | 63,158 | 17,033 | 10,346 | 784 | 4,427 | 22,825 | 3,090 |
| 1923..... | 251,611 | 103,843 | 36,368 | 111,409 | 8,875 | 52,917 | 15,422 | 8,847 | 651 | 3,907 | 17,910 | 2,805 |
| 1921..... | 209,242 | 102,963 | 21,421 | 84,858 | 8,622 | 36,458 | 19,978 | 6,749 | 396 | 2,444 | 10,114 | 2,089 |

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¹ Includes 1,008 miles of miscellaneous surfacing not allocated by types.

MISCELLANEOUS AGRICULTURAL STATISTICS

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TABLE 573.—Total State highway income and funds available, 1928, as reported by State authorities

| State | Total funds available | Balances at first of year | Total income for State high-ways | State taxes and appropriations | Motor vehicle fees | Gasoline-tax receipts | From counties and miscellaneous | State high-way bonds sold | Federal aid road funds used |
|---------------------|-----------------------|---------------------------|----------------------------------|--------------------------------|--------------------|-----------------------|---------------------------------|---------------------------|-----------------------------|
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Alabama..... | 21,023 | 1,934 | 19,089 | ..... | 2,635 | 3,194 | 197 | 10,085 | 2,978 |
| Arizona..... | 3,169 | —172 | 3,341 | 1,386 | 488 | 1,039 | 6 | ..... | 422 |
| Arkansas..... | 36,314 | 7,632 | 28,682 | ..... | 3,786 | 5,383 | 221 | 18,173 | 1,119 |
| California..... | 38,535 | 7,070 | 31,465 | 4,764 | 3,695 | 19,339 | 1,210 | ..... | 2,457 |
| Colorado..... | 8,476 | 1,845 | 6,631 | 1,360 | 835 | 2,666 | 40 | ..... | 1,730 |
| Connecticut..... | 22,994 | 10,214 | 12,780 | 1,583 | 6,797 | 3,107 | 877 | ..... | 416 |
| Delaware..... | 3,612 | 252 | 3,360 | ..... | 928 | 789 | 446 | 987 | 210 |
| Florida..... | 14,086 | 592 | 14,094 | 5 | 3,429 | 6,771 | 3,017 | ..... | 872 |
| Georgia..... | 13,169 | 251 | 12,918 | ..... | 3,910 | 5,151 | 1,957 | ..... | 1,900 |
| Idaho..... | 5,447 | 720 | 4,727 | 308 | 189 | 2,006 | 979 | ..... | 1,245 |
| Illinois..... | 57,398 | 2,440 | 54,958 | 297 | 15,070 | ..... | 380 | 35,156 | 4,055 |
| Indiana..... | 18,498 | 2,415 | 16,073 | ..... | 5,435 | 7,287 | 695 | ..... | 2,656 |
| Iowa..... | 43,640 | 5,659 | 37,981 | ..... | 10,037 | 4,785 | 138 | 20,189 | 2,832 |
| Kansas..... | 13,904 | 2 | 13,902 | 150 | 3,151 | 4,256 | 4,037 | ..... | 2,286 |
| Kentucky..... | 14,871 | 658 | 14,213 | 906 | 3,700 | 4,675 | 2,924 | ..... | 2,008 |
| Louisiana..... | 12,753 | 2,243 | 10,510 | ..... | 4,382 | 3,278 | 1,806 | ..... | 954 |
| Maine..... | 13,432 | 1,262 | 12,170 | 2,577 | 2,715 | 3,209 | 2,553 | 874 | 242 |
| Maryland..... | 12,546 | 2,112 | 10,434 | 50 | 1,962 | 4,360 | 2,092 | 1,239 | 731 |
| Massachusetts..... | 17,510 | 669 | 16,841 | 993 | 12,179 | ..... | 2,703 | ..... | 966 |
| Michigan..... | 40,954 | 1,535 | 39,419 | ..... | 18,616 | 16,329 | 2,105 | ..... | 2,369 |
| Minnesota..... | 29,664 | 8,903 | 20,761 | 1,922 | 10,066 | 5,590 | 942 | ..... | 2,241 |
| Mississippi..... | 7,302 | 1,079 | 6,223 | ..... | 214 | 2,582 | 1,916 | ..... | 1,511 |
| Missouri..... | 23,340 | 4,843 | 18,497 | 97 | 8,701 | 6,785 | 531 | ..... | 2,383 |
| Montana..... | 4,082 | 252 | 3,830 | ..... | ..... | 1,743 | 342 | ..... | 1,745 |
| Nebraska..... | 7,384 | 245 | 7,139 | 100 | 1,150 | 3,932 | 141 | ..... | 1,816 |
| Nevada..... | 2,191 | —44 | 2,235 | 8 | 249 | 260 | 577 | 100 | 1,041 |
| New Hampshire..... | 6,888 | 1,319 | 5,569 | ..... | 1,906 | 1,413 | 1,877 | ..... | 373 |
| New Jersey..... | 39,729 | 10,136 | 29,593 | 2,625 | 12,248 | 8,362 | 616 | 5,010 | 732 |
| New Mexico..... | 7,598 | 307 | 7,291 | 717 | 372 | 1,960 | 270 | 2,153 | 1,819 |
| New York..... | 106,825 | 44,586 | 62,239 | 29,455 | 20,000 | ..... | 9,149 | ..... | 3,635 |
| North Carolina..... | 42,293 | 9,912 | 32,381 | 1,250 | 9,566 | 9,377 | 472 | 10,000 | 1,716 |
| North Dakota..... | 3,775 | 236 | 3,539 | 170 | 729 | 1,460 | 29 | ..... | 1,151 |
| Ohio..... | 37,264 | 955 | 36,309 | 175 | 6,077 | 15,472 | 11,238 | ..... | 3,347 |
| Oklahoma..... | 13,488 | 456 | 13,032 | ..... | 2,600 | 4,850 | 3,894 | ..... | 1,688 |
| Oregon..... | 11,038 | 1,023 | 10,015 | ..... | 4,927 | 3,658 | 848 | ..... | 582 |
| Pennsylvania..... | 80,054 | 24,147 | 55,907 | 15 | 27,213 | 18,760 | 6,098 | ..... | 3,821 |
| Rhode Island..... | 7,724 | 3,393 | 4,331 | 9 | 2,296 | 1,299 | 76 | 256 | 425 |
| South Carolina..... | 27,800 | 9,194 | 18,606 | ..... | 2,367 | 3,285 | 11,820 | ..... | 1,134 |
| South Dakota..... | 6,001 | 6 | 5,995 | 634 | 1,456 | 2,278 | 61 | ..... | 1,566 |
| Tennessee..... | 24,838 | —165 | 25,003 | 2 | 3,957 | 4,638 | 7,234 | 8,011 | 1,161 |
| Texas..... | 39,290 | 5,860 | 33,430 | ..... | 9,959 | 14,408 | 4,786 | ..... | 4,277 |
| Utah..... | 4,717 | 92 | 4,625 | ..... | 413 | 2,217 | 889 | ..... | 1,106 |
| Vermont..... | 10,005 | 96 | 9,909 | 711 | 2,034 | 972 | 498 | 5,000 | 694 |
| Virginia..... | 16,401 | 974 | 15,427 | 2,056 | 5,051 | 5,546 | 1,335 | ..... | 1,439 |
| Washington..... | 13,893 | ..... | 13,893 | ..... | 6,281 | 4,172 | 2,060 | ..... | 1,380 |
| West Virginia..... | 18,668 | 4,524 | 14,144 | ..... | 4,396 | 4,243 | 40 | 4,250 | 1,215 |
| Wisconsin..... | 26,254 | 4,003 | 22,251 | ..... | 10,403 | 6,326 | 2,593 | ..... | 2,959 |
| Wyoming..... | 4,059 | 525 | 3,534 | 90 | 565 | 952 | 527 | | 1,391 |
| Total..... | 1,035,486 | 186,160 | 849,326 | 54,424 | 259,135 | 234,164 | 99,322 | 121,483 | 80,798 |

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TABLE 574.—*Total State highway road and bridge disbursements, 1928, as reported by State authorities*

| State | Grand total disbursements | Expenditure for state highway purposes | | | | | | Other disbursements by State highway department | |
|---------------------|---------------------------|--|-------------------------------|---------------|------------------------|--------------------------|-------------------|---|-----------------------|
| | | Total expenditure for State highways | Construction and right of way | Maintenance | Miscellaneous expenses | Equipment material, etc. | Interest on bonds | Retirement of bonds | County fund transfers |
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Alabama..... | 20, 110 | 19, 291 | 15, 082 | 759 | 39 | 2, 154 | 1, 257 | 819 | ..... |
| Arizona..... | 2, 443 | 2, 443 | 1, 001 | 860 | 330 | 243 | ..... | ..... | ..... |
| Arkansas..... | 31, 784 | 23, 812 | 20, 208 | 2, 174 | 255 | 254 | 861 | 6, 504 | 1, 468 |
| California..... | 24, 965 | 23, 190 | 14, 507 | 5, 128 | 566 | 2, 989 | 1, 775 | ..... | ..... |
| Colorado..... | 6, 957 | 6, 357 | 4, 444 | 949 | 7 | 516 | 441 | 600 | ..... |
| Connecticut..... | 16, 419 | 16, 419 | 12, 435 | 3, 890 | 94 | ..... | ..... | ..... | ..... |
| Delaware..... | 3, 377 | 3, 069 | 1, 857 | 205 | 185 | ..... | 842 | 288 | ..... |
| Florida..... | 14, 343 | 14, 343 | 12, 428 | 1, 538 | 151 | 229 | ..... | ..... | ..... |
| Georgia..... | 12, 728 | 12, 728 | 10, 804 | 1, 284 | 14 | 566 | ..... | ..... | ..... |
| Idaho..... | 5, 413 | 5, 274 | 4, 096 | 796 | 156 | 88 | 138 | 139 | ..... |
| Illinois..... | 53, 472 | 51, 473 | 44, 279 | 2, 409 | 428 | 207 | 4, 150 | 1, 999 | ..... |
| Indiana..... | 16, 544 | 16, 544 | 12, 495 | 3, 218 | ..... | 831 | ..... | ..... | ..... |
| Iowa..... | 37, 255 | 34, 398 | 29, 509 | 3, 810 | 220 | ..... | 859 | 638 | 2, 219 |
| Kansas..... | 13, 904 | 13, 904 | 10, 961 | 2, 355 | ..... | 558 | ..... | ..... | ..... |
| Kentucky..... | 14, 706 | 14, 261 | 12, 207 | 1, 515 | 17 | 385 | 137 | ..... | 505 |
| Louisiana..... | 11, 157 | 10, 686 | 7, 138 | 2, 506 | 249 | 669 | 124 | 457 | 14 |
| Maine..... | 11, 052 | 10, 571 | 7, 463 | 1, 793 | 245 | 506 | 564 | 481 | ..... |
| Maryland..... | 10, 668 | 10, 668 | 5, 689 | 4, 860 | 119 | ..... | ..... | ..... | ..... |
| Massachusetts..... | 16, 478 | 13, 801 | 10, 744 | 1, 907 | 80 | 145 | 925 | ..... | 2, 077 |
| Michigan..... | 36, 578 | 24, 098 | 15, 232 | 5, 519 | 655 | 443 | 2, 249 | 2, 667 | 9, 813 |
| Minnesota..... | 18, 412 | 18, 251 | 11, 053 | 4, 724 | ..... | 880 | 1, 594 | 161 | ..... |
| Mississippi..... | 6, 281 | 6, 281 | 3, 395 | 2, 518 | 127 | 211 | ..... | ..... | ..... |
| Missouri..... | 18, 981 | 17, 981 | 12, 693 | 2, 572 | 133 | 471 | 2, 112 | 1, 000 | ..... |
| Montana..... | 3, 863 | 3, 863 | 3, 328 | 410 | ..... | 125 | ..... | ..... | ..... |
| Nebraska..... | 6, 984 | 6, 984 | 4, 971 | 1, 906 | ..... | 107 | ..... | ..... | ..... |
| Nevada..... | 2, 167 | 2, 067 | 1, 362 | 390 | 52 | 235 | 28 | 100 | ..... |
| New Hampshire..... | 5, 553 | 5, 469 | 2, 534 | 2, 609 | 55 | 271 | ..... | ..... | 84 |
| New Jersey..... | 32, 479 | 31, 700 | 28, 144 | 5, 126 | 22 | 3 | 405 | 719 | 60 |
| New Mexico..... | 6, 603 | 5, 947 | 4, 199 | 1, 083 | ..... | 566 | 99 | 656 | ..... |
| New York..... | 62, 503 | 56, 618 | 42, 513 | 9, 878 | 27 | ..... | 4, 200 | 400 | 5, 485 |
| North Carolina..... | 28, 301 | 24, 675 | 14, 560 | 4, 506 | 868 | ..... | 4, 721 | ..... | 3, 626 |
| North Dakota..... | 3, 564 | 3, 564 | 2, 680 | 749 | 39 | 96 | ..... | ..... | ..... |
| Ohio..... | 33, 953 | 33, 953 | 21, 216 | 11, 625 | 890 | 222 | ..... | ..... | ..... |
| Oklahoma..... | 13, 251 | 13, 251 | 10, 207 | 2, 780 | 242 | 22 | ..... | ..... | ..... |
| Oregon..... | 10, 268 | 8, 518 | 3, 421 | 3, 323 | 188 | ..... | 1, 586 | 1, 750 | ..... |
| Pennsylvania..... | 59, 616 | 51, 850 | 22, 076 | 17, 570 | 3, 733 | 4, 180 | 4, 291 | 2, 747 | 2, 019 |
| Rhode Island..... | 4, 548 | 4, 454 | 2, 111 | 1, 818 | 57 | 282 | 186 | 64 | 30 |
| South Carolina..... | 21, 069 | 18, 976 | 16, 284 | 2, 151 | 1 | 540 | ..... | ..... | 2, 123 |
| South Dakota..... | 5, 893 | 5, 893 | 3, 551 | 1, 974 | 357 | 7 | 4 | ..... | ..... |
| Tennessee..... | 19, 172 | 19, 172 | 12, 815 | 4, 899 | 98 | 1, 198 | 162 | ..... | ..... |
| Texas..... | 28, 710 | 28, 710 | 14, 434 | 12, 327 | 369 | 1, 580 | ..... | ..... | ..... |
| Utah..... | 3, 992 | 3, 579 | 2, 082 | 815 | 100 | 257 | 325 | 413 | ..... |
| Vermont..... | 5, 762 | 5, 762 | 3, 913 | 1, 525 | ..... | 324 | ..... | ..... | ..... |
| Virginia..... | 14, 449 | 14, 238 | 10, 487 | 3, 514 | 79 | ..... | 158 | ..... | 210 |
| Washington..... | 13, 893 | 11, 833 | 8, 853 | 2, 826 | ..... | 154 | ..... | ..... | 2, 000 |
| West Virginia..... | 16, 224 | 13, 567 | 7, 539 | 2, 996 | 508 | 388 | 2, 136 | 2, 640 | 17 |
| Wisconsin..... | 20, 017 | 16, 542 | 12, 637 | 3, 742 | 144 | 19 | ..... | ..... | 3, 475 |
| Wyoming..... | 3, 600 | 3, 600 | 2, 517 | | 979 | | 94 | | |
| Total..... | 827, 550 | 764, 648 | 536, 294 | 158, 870 | 11, 333 | 20, 505 | 37, 637 | 27, 017 | 35, 885 |

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TABLE 575.—*Mileage of county and local roads at end of 1928, from records and reports of local authorities*

| State | Total mileage, local roads | Earth, non-surfaced | Surfaced roads, by types | | | | | | | | Brick and block |
|---------------------|----------------------------|---------------------|--------------------------|--------------------|---------------------|---|--------------------|---------------|---------------------|--------------------------|-----------------|
| | | | Total surfaced mileage | Sand-clay top-soil | Gravel, chert, etc. | Water-bound macadam (treated and untreated) | Bituminous macadam | Sheet asphalt | Bituminous concrete | Portland cement concrete | |
| Alabama..... | 61,004 | 46,374 | 14,630 | 7,433 | 6,791 | 293 | 44 | 10 | 59 | 24 | 6 |
| Arizona..... | 19,636 | 17,801 | 1,835 | 334 | 1,133 | 25 | 55 | 13 | 275 | 5 | |
| Arkansas..... | 66,039 | 64,176 | 1,863 | 210 | 1,594 | 46 | 7 | 1 | 5 | | |
| California..... | 73,032 | 51,879 | 21,153 | 1,596 | 12,779 | 1,155 | 2,334 | 16 | 1,084 | 2,186 | |
| Colorado..... | 59,185 | 56,388 | 2,797 | 1,392 | 1,399 | | | | 2 | 4 | |
| Connecticut..... | 12,022 | 10,478 | 1,544 | | 989 | 378 | 83 | 7 | | 85 | 2 |
| Delaware..... | 3,094 | 2,703 | 391 | | 151 | 194 | 21 | | 20 | 4 | 1 |
| Florida..... | 23,326 | 12,542 | 10,784 | 3,453 | 922 | 4,966 | 169 | 624 | 68 | 831 | 499 |
| Georgia..... | 93,264 | 83,088 | 10,196 | 8,348 | 1,268 | 76 | 250 | 51 | | 201 | 2 |
| Idaho..... | 34,834 | 28,719 | 6,115 | 1,769 | 4,281 | | 19 | | 41 | 5 | |
| Illinois..... | 87,730 | 73,950 | 13,780 | | 11,828 | 450 | 80 | 23 | | 128 | 118 |
| Indiana..... | 68,999 | 22,596 | 46,403 | | 42,991 | 1,527 | 324 | 19 | 180 | 1,211 | 151 |
| Iowa..... | 96,523 | 86,503 | 10,020 | | 10,007 | | | | | 13 | |
| Kansas..... | 123,554 | 121,698 | 1,856 | 600 | 1,100 | 65 | 40 | 7 | 1 | 41 | 2 |
| Kentucky..... | 49,761 | 38,768 | 10,993 | 163 | 3,901 | 6,839 | 61 | 2 | 5 | 22 | |
| Louisiana..... | 26,440 | 21,966 | 4,444 | 60 | 4,360 | 11 | 5 | | 7 | 1 | |
| Maine..... | 19,091 | 15,479 | 3,612 | 9 | 3,572 | 13 | 15 | | | 3 | |
| Maryland..... | 12,079 | 9,242 | 2,837 | 157 | 1,618 | 946 | 8 | 4 | | 106 | |
| Massachusetts..... | 17,354 | 10,150 | 7,204 | 64 | 4,722 | 777 | 1,212 | 11 | 348 | 61 | 9 |
| Michigan..... | 73,402 | 50,005 | 17,397 | 19 | 14,478 | 1,389 | 163 | 6 | 78 | 1,259 | 5 |
| Minnesota..... | 103,500 | 75,893 | 27,607 | 5,761 | 21,598 | 110 | | 12 | 19 | 107 | |
| Mississippi..... | 50,733 | 41,120 | 9,613 | 204 | 9,152 | 32 | 46 | 8 | 71 | 95 | 5 |
| Missouri..... | 103,065 | 95,014 | 8,051 | 1,462 | 5,105 | 1,280 | 93 | | 51 | 60 | |
| Montana..... | 58,924 | 57,100 | 1,824 | 129 | 1,700 | 2 | 2 | | | | |
| Nebraska..... | 85,900 | 85,126 | 774 | 243 | 485 | 4 | 2 | | 9 | 29 | 2 |
| Nevada..... | 19,488 | 18,908 | 580 | 23 | 551 | | 6 | | | | |
| New Hampshire..... | 9,663 | 9,281 | 382 | 24 | 324 | 22 | 11 | | 1 | | |
| New Jersey..... | 15,201 | 8,148 | 7,053 | 166 | 3,507 | 1,249 | 520 | 364 | 534 | 657 | 56 |
| New Mexico..... | 38,978 | 38,627 | 351 | 80 | 265 | | | | | | |
| New York..... | 69,190 | 45,638 | 20,552 | | 7,055 | 7,225 | 5,247 | | 1,025 | | |
| North Carolina..... | 64,392 | 42,437 | 21,955 | 18,216 | 2,773 | 276 | 279 | 90 | 30 | 296 | 25 |
| North Dakota..... | 99,634 | 98,926 | 708 | | 708 | | | | | | |
| Ohio..... | 74,046 | 38,298 | 35,748 | | 26,405 | 5,917 | 2,402 | 37 | 78 | 646 | 263 |
| Oklahoma..... | 114,485 | 112,769 | 1,716 | 219 | 1,374 | 1 | 12 | 8 | 6 | 96 | |
| Oregon..... | 47,265 | 38,760 | 8,505 | 234 | 6,644 | 1,100 | 9 | | 362 | 156 | |
| Pennsylvania..... | 77,366 | 61,631 | 15,735 | | 11,858 | 1,920 | 515 | 66 | 424 | 534 | 418 |
| Rhode Island..... | 1,679 | 1,201 | 478 | | 248 | 117 | 92 | 16 | | 2 | 3 |
| South Carolina..... | 51,283 | 39,292 | 11,991 | 11,248 | 658 | 7 | 6 | | 50 | 19 | 3 |
| South Dakota..... | 114,299 | 112,872 | 1,427 | | 1,427 | | | | | | |
| Tennessee..... | 59,193 | 50,189 | 9,004 | 236 | 5,200 | 3,446 | 43 | 6 | 8 | 64 | 1 |
| Texas..... | 169,836 | 155,370 | 14,466 | 2,634 | 11,100 | 467 | 40 | 26 | 20 | 179 | |
| Utah..... | 19,979 | 17,626 | 2,353 | 30 | 2,248 | | 2 | | 30 | 43 | |
| Vermont..... | 10,837 | 9,364 | 1,473 | 144 | 1,325 | | 1 | 3 | | | |
| Virginia..... | 52,766 | 45,591 | 7,175 | 3,750 | 1,640 | 1,310 | 340 | | | 135 | |
| Washington..... | 40,633 | 26,961 | 13,672 | 975 | 10,025 | 1,704 | 44 | | 124 | 758 | 42 |
| West Virginia..... | 30,979 | 29,454 | 1,525 | | 491 | 298 | 406 | | 40 | 222 | 68 |
| Wisconsin..... | 71,068 | 52,939 | 18,129 | 3,080 | 13,848 | 847 | | | | 354 | |
| Wyoming..... | 38,068 | 37,770 | 298 | 97 | 201 | | | | | | |
| Total, 1928..... | 2,709,839 | 2,276,840 | 432,999 | 74,562 | 277,797 | 46,454 | 14,953 | 1,472 | 3,763 | 12,317 | 1,681 |
| Total: 1927..... | 2,720,231 | 2,308,076 | 412,155 | 71,770 | 263,088 | 45,500 | 13,525 | 1,454 | 3,680 | 11,438 | 1,700 |
| 1926..... | 2,712,202 | 2,325,257 | 387,005 | 69,711 | 245,524 | 42,732 | 11,651 | 1,548 | 3,607 | 10,405 | 1,827 |
| 1925..... | 2,731,172 | 2,354,766 | 376,406 | 68,211 | 224,036 | 65,604 | 10,490 | 1,921 | 3,420 | 10,106 | 2,059 |
| 1924..... | 2,743,195 | 2,403,637 | 339,558 | 53,638 | 193,465 | 60,139 | 7,853 | 1,489 | 2,991 | 8,363 | 1,624 |
| 1923..... | 2,744,116 | 2,410,175 | 332,941 | 52,425 | 186,314 | 59,200 | 6,950 | 1,395 | 2,824 | 7,289 | 1,569 |
| 1921..... | 2,732,052 | 2,429,150 | 302,902 | 54,717 | 163,441 | 60,307 | 3,515 | 1,205 | 2,534 | 5,497 | 1,331 |

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1 Includes 859 miles of miscellaneous types.

2 Includes 9,996 miles of miscellaneous types.

3 Includes 9,975 miles of miscellaneous types.

4 Includes 10,295 miles of miscellaneous types.

TABLE 576.—*Local road income and funds available, 1928, compiled from records of local authorities*

| State | Total funds available | Balance at first of year | Total income for local roads | Local road bond sales | Local road taxes and appropriations | Motor-vehicle fees | Gasoline tax receipts | Funds from State for local roads | Miscellaneous income |
|---------------------|-----------------------|--------------------------|------------------------------|-----------------------|-------------------------------------|--------------------|-----------------------|----------------------------------|----------------------|
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Alabama..... | 13,565 | 1,473 | 12,092 | 1,713 | 5,480 | 53 | 3,353 | ----- | 1,493 |
| Arizona..... | 2,088 | 150 | 1,938 | 103 | 895 | ----- | 672 | 155 | 113 |
| Arkansas..... | 8,920 | 786 | 8,134 | ----- | 2,150 | 2,423 | 3,445 | ----- | 116 |
| California..... | 51,922 | 13,067 | 38,855 | 7,028 | 18,899 | 3,192 | 8,860 | 154 | 722 |
| Colorado..... | 4,758 | 349 | 4,409 | ----- | 2,445 | 448 | 785 | 544 | 187 |
| Connecticut..... | 3,193 | ----- | 3,193 | ----- | 3,193 | ----- | ----- | ----- | ----- |
| Delaware..... | 1,909 | 275 | 1,634 | 350 | 923 | ----- | ----- | 269 | 92 |
| Florida..... | 46,694 | 21,739 | 24,955 | 5,383 | 15,174 | 916 | 2,260 | ----- | 1,222 |
| Georgia..... | 18,184 | 2,215 | 15,969 | 2,434 | 11,038 | ----- | 2,158 | ----- | 339 |
| Idaho..... | 8,802 | 2,406 | 6,396 | 451 | 3,463 | 1,375 | ----- | ----- | 1,107 |
| Illinois..... | 31,755 | 1,651 | 30,104 | 1,197 | 28,248 | ----- | ----- | ----- | 659 |
| Indiana..... | 52,682 | 10,775 | 41,907 | 11,517 | 27,597 | ----- | 2,790 | ----- | 3 |
| Iowa..... | 28,180 | 3,576 | 24,604 | 1,429 | 15,392 | ----- | 3,674 | 1,287 | 2,832 |
| Kansas..... | 27,614 | 7,306 | 20,308 | 1,543 | 14,040 | ----- | 2,785 | ----- | 1,940 |
| Kentucky..... | 10,195 | ----- | 10,195 | 3,462 | 6,102 | 369 | ----- | ----- | 262 |
| Louisiana..... | 16,820 | 7,089 | 9,731 | 480 | 8,409 | ----- | ----- | ----- | 842 |
| Maine..... | 2,762 | 39 | 2,801 | 40 | 2,661 | ----- | ----- | ----- | 100 |
| Maryland..... | 4,916 | ----- | 4,916 | 1,310 | 3,277 | ----- | ----- | ----- | 329 |
| Massachusetts..... | 14,047 | 134 | 13,913 | 204 | 11,095 | ----- | ----- | 2,372 | 242 |
| Michigan..... | 64,984 | 14,245 | 50,739 | 8,240 | 29,394 | 6,000 | 3,363 | 2,037 | 1,705 |
| Minnesota..... | 25,018 | 1,119 | 23,899 | 1,015 | 18,542 | ----- | ----- | 2,862 | 1,480 |
| Mississippi..... | 37,634 | 8,802 | 28,832 | 8,511 | 12,270 | 2,430 | 2,748 | ----- | 2,873 |
| Missouri..... | 15,587 | 1,500 | 14,087 | 2,274 | 9,423 | ----- | ----- | ----- | 2,390 |
| Montana..... | 5,853 | 1,218 | 4,635 | 120 | 2,970 | 1,250 | ----- | 75 | 220 |
| Nebraska..... | 10,194 | 1,262 | 8,932 | ----- | 5,901 | 2,703 | ----- | ----- | 328 |
| Nevada..... | 1,634 | 524 | 1,110 | 6 | 767 | 20 | 252 | 51 | 14 |
| New Hampshire..... | 3,903 | ----- | 3,903 | ----- | 3,810 | ----- | ----- | 84 | 9 |
| New Jersey..... | 27,120 | 2,834 | 24,286 | 5,415 | 13,446 | 2,879 | ----- | 1,642 | 904 |
| New Mexico..... | 542 | 82 | 460 | ----- | 285 | 155 | ----- | 8 | 12 |
| New York..... | 52,384 | 4,291 | 48,093 | ----- | 28,979 | 5,197 | ----- | 5,485 | 8,432 |
| North Carolina..... | 31,983 | 1,750 | 30,233 | 10,040 | 13,297 | ----- | ----- | 3,626 | 3,270 |
| North Dakota..... | 6,380 | 1,769 | 4,611 | ----- | 3,874 | 737 | ----- | ----- | ----- |
| Ohio..... | 81,582 | 12,000 | 69,582 | 17,150 | 42,800 | 5,484 | 4,148 | ----- | 797 |
| Oklahoma..... | 18,200 | 1,732 | 16,468 | 1,200 | 8,000 | 3,755 | 2,716 | ----- | 850 |
| Oregon..... | 14,470 | 1,720 | 12,750 | 3,750 | 5,300 | 1,510 | 190 | 1,150 | 6,128 |
| Pennsylvania..... | 81,259 | 16,864 | 64,395 | 15,502 | 35,249 | ----- | 3,694 | 3,852 | 138 |
| Rhode Island..... | 1,004 | 22 | 982 | 38 | 806 | ----- | ----- | ----- | 1,140 |
| South Carolina..... | 17,046 | 1,411 | 15,635 | 8,574 | 3,751 | ----- | 2,170 | ----- | 154 |
| South Dakota..... | 7,189 | ----- | 7,189 | ----- | 5,535 | 1,392 | ----- | 108 | 1,428 |
| Tennessee..... | 26,017 | 10,812 | 15,205 | 5,928 | 7,724 | 125 | ----- | ----- | 200 |
| Texas..... | 44,400 | 5,300 | 39,100 | 14,000 | 17,700 | 7,200 | ----- | ----- | 96 |
| Utah..... | 2,261 | 672 | 1,589 | ----- | 1,493 | ----- | ----- | ----- | ----- |
| Vermont..... | 1,040 | ----- | 1,040 | ----- | 740 | ----- | ----- | 300 | 1,912 |
| Virginia..... | 13,888 | 3,658 | 10,230 | 1,376 | 4,540 | ----- | 2,192 | 210 | 800 |
| Washington..... | 10,506 | 756 | 9,750 | 110 | 7,120 | 820 | 120 | 780 | 130 |
| West Virginia..... | 18,694 | 3,500 | 15,194 | 3,742 | 11,322 | ----- | ----- | ----- | 2,995 |
| Wisconsin..... | 37,561 | 2,102 | 35,459 | 4,587 | 22,509 | ----- | 1,434 | 3,934 | 12 |
| Wyoming..... | 885 | ----- | 885 | ----- | 744 | ----- | ----- | ----- | ----- |
| Total..... | 1,008,224 | 172,897 | 835,327 | 150,222 | 498,762 | 50,433 | 53,779 | 30,997 | 51,134 |

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TABLE 577.—*Local road disbursements, 1928, compiled from records of local authorities*

| State | Total disbursements | Expenditures for local road purposes | | | | | Other disbursements by local authorities | |
|---------------------|---------------------|--------------------------------------|---------------|---------------|---|-------------------|--|--------------------------------------|
| | | Total expenditures for local roads | Construction | Maintenance | Miscellaneous and overhead ¹ | Interest on bonds | Principal payments on bonds | Fund transfers to State ² |
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Alabama..... | 11,425 | 8,797 | 1,898 | 5,128 | 300 | 1,471 | 1,843 | 785 |
| Arizona..... | 1,953 | 1,716 | 344 | 870 | 315 | 187 | 191 | 46 |
| Arkansas..... | 8,330 | 5,884 | 760 | 2,740 | 62 | 2,322 | 2,446 | ----- |
| California..... | 37,733 | 34,513 | 15,682 | 14,452 | 1,776 | 2,603 | 2,822 | 398 |
| Colorado..... | 4,924 | 4,884 | 1,165 | 2,865 | 852 | 2 | ----- | 40 |
| Connecticut..... | 3,132 | 3,132 | 601 | 2,531 | ----- | ----- | ----- | ----- |
| Delaware..... | 1,509 | 1,275 | 613 | 573 | 89 | ----- | 225 | 9 |
| Florida..... | 32,449 | 30,213 | 13,160 | 5,518 | 2,290 | 9,239 | 2,236 | ----- |
| Georgia..... | 16,471 | 13,897 | 3,905 | 7,800 | 656 | 1,536 | 863 | 1,711 |
| Idaho..... | 6,334 | 4,852 | 1,176 | 1,254 | 1,411 | 1,011 | 598 | 884 |
| Illinois..... | 30,203 | 28,276 | 8,834 | 17,558 | 847 | 1,037 | 1,927 | ----- |
| Indiana..... | 42,027 | 29,521 | 11,551 | 13,241 | 783 | 3,946 | 12,265 | 241 |
| Iowa..... | 24,769 | 23,519 | 9,205 | 12,648 | 766 | 900 | 1,250 | ----- |
| Kansas..... | 21,239 | 15,732 | 7,128 | 6,004 | 1,400 | 1,200 | 1,457 | 4,050 |
| Kentucky..... | 9,831 | 5,910 | 1,076 | 3,478 | 449 | 907 | 988 | 2,933 |
| Louisiana..... | 12,464 | 7,395 | 1,294 | 2,730 | 452 | 2,910 | 2,385 | 2,684 |
| Maine..... | 2,800 | 2,736 | 350 | 2,228 | 100 | 60 | 62 | ----- |
| Maryland..... | 4,988 | 3,711 | 1,284 | 1,809 | 173 | 385 | 258 | 1,019 |
| Massachusetts..... | 13,485 | 12,456 | 5,376 | 6,289 | 702 | 89 | 590 | 439 |
| Michigan..... | 51,523 | 43,083 | 24,023 | 17,362 | ----- | 1,698 | 8,440 | ----- |
| Minnesota..... | 24,165 | 23,155 | 15,000 | 4,872 | 2,137 | 1,146 | 1,010 | ----- |
| Mississippi..... | 24,265 | 19,062 | 6,837 | 8,029 | 866 | 3,330 | 3,227 | 1,976 |
| Missouri..... | 12,787 | 11,163 | 4,344 | 4,828 | 1,435 | 556 | 1,624 | ----- |
| Montana..... | 5,080 | 4,265 | 1,200 | 2,250 | 275 | 540 | 750 | 65 |
| Nebraska..... | 9,269 | 9,027 | 4,896 | 3,305 | 625 | 201 | 100 | 142 |
| Nevada..... | 1,009 | 626 | 192 | 314 | 58 | 62 | 109 | 274 |
| New Hampshire..... | 3,903 | 2,258 | 149 | 1,693 | 416 | ----- | ----- | 1,645 |
| New Jersey..... | 25,820 | 22,096 | 13,490 | 6,522 | 216 | 1,868 | 3,724 | ----- |
| New Mexico..... | 473 | 460 | 67 | 330 | 58 | 5 | ----- | 13 |
| New York..... | 48,437 | 48,277 | 26,222 | 15,298 | 3,498 | 3,259 | 160 | ----- |
| North Carolina..... | 29,005 | 19,614 | 6,290 | 5,070 | 1,514 | 6,740 | 9,196 | 195 |
| North Dakota..... | 4,372 | 4,312 | 3,668 | 550 | 82 | 12 | 60 | ----- |
| Ohio..... | 69,611 | 40,156 | 21,187 | 13,469 | ----- | 5,500 | 18,900 | 10,555 |
| Oklahoma..... | 16,930 | 12,057 | 2,727 | 7,500 | 800 | 1,030 | 1,000 | 3,873 |
| Oregon..... | 12,860 | 11,610 | 7,300 | 2,800 | 410 | 1,100 | 1,250 | ----- |
| Pennsylvania..... | 60,818 | 43,133 | 20,892 | 12,195 | 4,678 | 5,368 | 8,397 | 9,288 |
| Rhode Island..... | 1,002 | 923 | 291 | 509 | 80 | 43 | 79 | ----- |
| South Carolina..... | 15,017 | 6,348 | 1,312 | 3,078 | 184 | 1,774 | 1,153 | 7,516 |
| South Dakota..... | 8,031 | 7,877 | 4,681 | 2,726 | 460 | 10 | 140 | 14 |
| Tennessee..... | 18,627 | 9,325 | 2,185 | 4,004 | 426 | 2,710 | 726 | 8,578 |
| Texas..... | 33,000 | 22,500 | 5,200 | 9,650 | 950 | 6,700 | 6,000 | 4,500 |
| Utah..... | 1,564 | 1,306 | 427 | 643 | 148 | 88 | 105 | 153 |
| Vermont..... | 1,040 | 840 | 390 | 450 | ----- | ----- | ----- | 200 |
| Virginia..... | 10,092 | 8,784 | 2,564 | 4,897 | ----- | 1,323 | 1,183 | 125 |
| Washington..... | 9,804 | 9,004 | 3,850 | 3,950 | 410 | 794 | 800 | ----- |
| West Virginia..... | 13,664 | 11,932 | 6,962 | 2,816 | 9 | 2,145 | 1,732 | ----- |
| Wisconsin..... | 32,981 | 26,709 | 10,268 | 10,350 | 4,136 | 1,955 | 986 | 5,286 |
| Wyoming..... | 927 | 899 | 293 | 517 | 53 | 36 | 25 | 3 |
| Total..... | 832,142 | 659,222 | 282,315 | 259,753 | 37,347 | 79,807 | 103,282 | 69,638 |

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¹ Administration and engineering included.² Not applicable to local road and bridge disbursements.

TABLE 578.—Motor-vehicle registration, 1928, as reported by State authorities

| State | Registered motor vehicles (private and commercial) | | | Regis- tered motor cycles | Tax exempt motor cars | Number licenses and permits | | Year's increase in registration | |
|-----------------------------|---|--|--|------------------------------------|--------------------------------|--------------------------------|--|------------------------------------|-------------|
| | All motor cars and trucks | Passen- ger autos, taxis, and busses | Motor trucks and road tractors | | | Deal- ers' licenses | Opera- tors' and chauf- feurs' permits | Number | Per cent |
| Alabama..... | 269,519 | 235,026 | 34,493 | 611 | 833 | 586 | 1,097 | 25,980 | 10.7 |
| Arizona..... | 94,372 | 86,086 | 8,336 | 281 | 1,161 | 1,039 | 12,342 | 13,325 | 18.4 |
| Arkansas..... | 214,931 | 181,280 | 33,651 | 342 | 890 | 508 | 4,085 | 8,363 | 4.0 |
| California..... | 1,799,800 | 1,582,477 | 217,413 | 9,449 | 14,743 | ..... | 263,346 | 106,696 | 6.3 |
| Colorado..... | 284,867 | 260,906 | 23,961 | 1,234 | 283 | 3,547 | 7,977 | 16,375 | 6.1 |
| Connecticut..... | 309,792 | 261,091 | 48,701 | 2,497 | 1,994 | 3,751 | 337,623 | 28,271 | 10.0 |
| Delaware ¹ | 51,210 | 41,195 | 10,015 | 345 | 44 | 610 | 56,923 | 4,086 | 8.7 |
| Florida..... | 352,961 | 296,691 | 56,270 | 1,127 | 3,727 | 2,047 | 2,853 | -41,773 | -10.6 |
| Georgia..... | 318,856 | 277,881 | 40,975 | 1,078 | 634 | 1,155 | 2,301 | 18,221 | 6.1 |
| Idaho..... | 108,154 | 96,960 | 11,194 | 406 | 1,334 | 458 | 395 | 6,818 | 6.7 |
| Illinois ¹ | 1,504,359 | 1,314,003 | 190,356 | 5,826 | 979 | 4,548 | 94,109 | 65,374 | 4.5 |
| Indiana..... | 823,806 | 706,713 | 117,093 | 3,124 | 7,715 | 2,716 | 39,021 | 10,160 | 1.2 |
| Iowa..... | 733,466 | 672,447 | 61,019 | 1,728 | 3,244 | 2,439 | 16,563 | 29,263 | 4.2 |
| Kansas ¹ | 533,799 | 471,897 | 61,902 | 1,109 | 2,655 | 2,676 | ..... | 31,898 | 6.4 |
| Kentucky..... | 304,231 | 272,636 | 31,595 | 742 | 2,000 | 1,138 | 9,146 | 18,610 | 6.5 |
| Louisiana..... | 264,293 | 223,445 | 40,848 | 625 | 209 | 499 | 16,029 | 9,293 | 3.6 |
| Maine..... | 172,638 | 139,460 | 33,178 | 1,219 | 1,390 | 1,155 | 203,353 | 9,015 | 5.5 |
| Maryland..... | 285,311 | 275,221 | 10,090 | 2,232 | 3,469 | 5,853 | 76,569 | 8,448 | 3.1 |
| Massachusetts..... | 726,295 | 637,153 | 89,142 | 6,856 | 556 | 2,370 | 870,160 | 32,188 | 4.6 |
| Michigan ¹ | 1,249,221 | 1,084,615 | 164,606 | 3,686 | 371 | 2,192 | 311,413 | 94,448 | 8.2 |
| Minnesota..... | 673,573 | 583,789 | 89,784 | 2,083 | 1,405 | 2,144 | ..... | 26,891 | 4.2 |
| Mississippi..... | 246,242 | 214,754 | 31,488 | 69 | 74 | 660 | ..... | 28,199 | 12.9 |
| Missouri..... | 712,965 | 636,717 | 76,248 | 1,821 | 1,783 | 2,572 | 29,222 | 30,546 | 4.5 |
| Montana..... | 126,035 | 104,231 | 21,804 | 185 | 1,471 | 612 | 210 | 13,300 | 11.8 |
| Nebraska..... | 391,355 | 358,173 | 33,182 | 1,026 | 1,514 | 3,344 | ..... | 17,443 | 4.7 |
| Nevada..... | 27,376 | 21,733 | 5,643 | 94 | 484 | 115 | ..... | 1,600 | 6.2 |
| New Hampshire..... | 102,644 | 88,594 | 14,050 | 1,330 | 22 | ..... | ..... | 6,635 | 6.9 |
| New Jersey..... | 758,430 | 629,748 | 128,682 | 6,633 | 7,071 | 3,176 | 1,186,736 | 46,034 | 6.5 |
| New Mexico..... | 65,737 | 63,743 | 1,994 | 248 | 901 | 201 | ..... | 6,446 | 10.9 |
| New York..... | 2,083,942 | 1,760,549 | 323,393 | 14,594 | 15,819 | 4,852 | 2,494,156 | 146,024 | 7.5 |
| North Carolina..... | 464,376 | 418,864 | 45,512 | 1,244 | 6,629 | 1,103 | ..... | 33,877 | 7.9 |
| North Dakota..... | 173,525 | 151,778 | 21,747 | 236 | 3 | ..... | ..... | 12,824 | 8.1 |
| Ohio..... | 1,649,699 | 1,450,994 | 198,705 | 9,472 | 12,459 | 3,967 | 4,419 | 78,965 | 5.0 |
| Oklahoma..... | 529,843 | 465,550 | 64,293 | 1,124 | 530 | 1,384 | ..... | 26,717 | 5.3 |
| Oregon..... | 248,118 | 227,404 | 20,714 | 2,012 | 1,435 | 581 | 49,250 | 3,546 | 1.4 |
| Pennsylvania..... | 1,642,207 | 1,420,957 | 221,250 | 13,807 | 2,326 | 4,300 | 1,093,455 | 87,292 | 5.6 |
| Rhode Island..... | 125,698 | 106,155 | 19,543 | 1,071 | 741 | 318 | 144,876 | 7,684 | 6.5 |
| South Carolina..... | 216,805 | 194,267 | 22,538 | 432 | 2,745 | 658 | ..... | 17,170 | 8.6 |
| South Dakota..... | 191,374 | 171,067 | 20,307 | 230 | 1,030 | 1,061 | ..... | 21,822 | 12.9 |
| Tennessee..... | 322,137 | 294,305 | 27,832 | 1,059 | 3,421 | 693 | ..... | 27,570 | 9.4 |
| Texas..... | 1,214,297 | 1,090,028 | 154,269 | 3,481 | 2,505 | 3,881 | 10,178 | 102,890 | 9.3 |
| Utah..... | 98,541 | 84,220 | 14,321 | 520 | 173 | ..... | ..... | 4,567 | 4.9 |
| Vermont..... | 86,231 | 78,685 | 7,546 | 521 | 28 | 376 | 89,606 | 6,704 | 8.4 |
| Virginia..... | 360,545 | 306,911 | 53,634 | 2,128 | 4,203 | 3,524 | 7,746 | 22,938 | 6.8 |
| Washington..... | 402,875 | 344,977 | 57,898 | 2,598 | 4,618 | 4,783 | 499,149 | 18,292 | 4.8 |
| West Virginia..... | 251,556 | 215,787 | 35,769 | 1,355 | 2,127 | 1,088 | 73,468 | 5,737 | 2.3 |
| Wisconsin..... | 742,135 | 646,747 | 95,388 | 2,746 | 1,360 | ..... | ..... | 43,846 | 6.3 |
| Wyoming..... | 56,336 | 48,760 | 7,576 | 128 | 560 | 329 | ..... | 4,381 | 8.4 |
| District of Columbia..... | 126,556 | 112,505 | 14,051 | 1,092 | 3,025 | 1,835 | 34,025 | 14,876 | 13.3 |
| Total..... | 24,493,124 | 21,379,125 | 3,113,999 | 117,946 | 136,797 | 86,734 | 8,941,861 | 1,350,883 | 5.9 |

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¹ Includes 7,859 United States cars at large not allocated to States.² Busses included with trucks.

TABLE 579.—Motor-vehicle revenues, 1928, as reported by State authorities

| State | Gross receipts | Motor car registration receipts | | | Miscellaneous receipts | Disposition of gross receipts ¹ | | | |
|------------------------|----------------|---------------------------------|---------------------------|---------------|------------------------|--|----------------|---------------|---------------------------------|
| | | All motor cars | Passenger cars and busses | Trucks, etc. | | Collection costs | State highways | Local roads | On road bonds and miscellaneous |
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Alabama..... | 3,474 | | | | | 152 | 1,076 | | 1,569 |
| Arizona..... | 568 | 434 | 301 | 133 | 132 | | 566 | | |
| Arkansas..... | 3,786 | 3,706 | | | 80 | 76 | 833 | 568 | 2,309 |
| California..... | 9,292 | 7,858 | 5,175 | 2,683 | 1,434 | 1,427 | 3,910 | 3,910 | 45 |
| Colorado..... | 1,790 | 1,659 | 1,332 | 327 | 131 | 166 | 812 | 812 | |
| Connecticut..... | 7,373 | 5,627 | 4,222 | 1,405 | 1,746 | | 7,373 | | |
| Delaware..... | 929 | 745 | 540 | 205 | 184 | | 929 | | |
| Florida..... | 4,956 | 4,874 | 3,612 | 1,262 | 62 | 522 | 3,201 | 1,166 | 47 |
| Georgia..... | 4,042 | 3,976 | 3,321 | 655 | 66 | 143 | 3,899 | | |
| Idaho..... | 1,627 | 1,578 | 1,308 | 270 | 49 | | 167 | 1,460 | |
| Illinois..... | 15,521 | 14,579 | 11,177 | 3,402 | 942 | | 9,337 | | 6,184 |
| Indiana..... | 5,752 | 5,348 | 4,121 | 1,227 | 404 | 219 | 5,503 | | |
| Iowa..... | 10,693 | 10,134 | 9,092 | 1,042 | 559 | 204 | 10,068 | 368 | 53 |
| Kansas..... | 5,394 | 5,377 | | | 17 | 287 | 3,213 | 1,894 | |
| Kentucky..... | 4,725 | 4,582 | 3,605 | 977 | 143 | 195 | 4,042 | 488 | |
| Louisiana..... | 4,384 | 4,303 | | | 81 | | 4,384 | | |
| Maine..... | 2,763 | 2,147 | 1,643 | 504 | 616 | 220 | 1,364 | | 1,179 |
| Maryland..... | 3,035 | 2,381 | 2,088 | 293 | 654 | 304 | 2,124 | | 607 |
| Massachusetts..... | 13,920 | 11,128 | 7,855 | 3,273 | 2,792 | 1,352 | 11,643 | | 925 |
| Michigan..... | 20,057 | 18,367 | 13,942 | 4,425 | 1,690 | 729 | 12,246 | 6,000 | 1,082 |
| Minnesota..... | 10,102 | 10,011 | 8,360 | 1,651 | 91 | | 6,507 | | 3,595 |
| Mississippi..... | 2,814 | | | | | 141 | 194 | 2,479 | |
| Missouri..... | 8,766 | | | | | 370 | 5,283 | | 3,113 |
| Montana..... | 1,299 | | | | | 76 | | 1,190 | 33 |
| Nebraska..... | 3,951 | 3,728 | 3,166 | 562 | 223 | 118 | 1,150 | 2,683 | |
| Nevada..... | 249 | | | | | 11 | 110 | | 128 |
| New Hampshire..... | 2,071 | 1,674 | | | 397 | 152 | 1,906 | | 13 |
| New Jersey..... | 13,569 | 9,934 | 6,165 | 3,769 | 3,635 | 850 | 7,882 | 4,537 | 300 |
| New Mexico..... | 628 | 599 | 531 | 68 | 29 | 70 | 372 | | 186 |
| New York..... | 34,307 | 31,084 | 22,301 | 8,783 | 3,223 | 1,786 | 24,000 | 5,196 | 3,325 |
| North Carolina..... | 6,088 | | | | | 300 | 3,975 | | 1,813 |
| North Dakota..... | 1,775 | 1,760 | 1,431 | 329 | 15 | 170 | 867 | | 738 |
| Ohio..... | 11,840 | 11,266 | 6,405 | 4,861 | 574 | 386 | 5,970 | 5,494 | |
| Oklahoma..... | 6,259 | | | | | | 2,504 | 3,755 | |
| Oregon..... | 6,969 | 6,720 | 5,742 | 978 | 249 | 300 | 1,666 | 1,667 | 3,336 |
| Pennsylvania..... | 27,114 | 20,760 | 14,382 | 6,378 | 6,354 | 1,784 | 20,510 | | 4,829 |
| Rhode Island..... | 2,274 | 1,832 | 1,389 | 443 | 442 | 212 | 2,031 | | |
| South Carolina..... | 2,440 | 2,282 | 1,942 | 340 | 158 | 25 | 2,415 | | |
| South Dakota..... | 2,902 | 2,872 | 2,481 | 391 | 30 | 60 | 1,450 | 1,392 | |
| Tennessee..... | 4,066 | | | | | 109 | 3,957 | | |
| Texas..... | 17,701 | 16,961 | 14,118 | 2,843 | 740 | 500 | 10,012 | 7,189 | |
| Utah..... | 731 | | | | | 130 | 343 | | 258 |
| Vermont..... | 2,091 | 1,784 | 1,498 | 286 | 307 | | 2,091 | | |
| Virginia..... | 5,572 | 5,169 | 4,342 | 827 | 403 | 260 | 5,312 | | |
| Washington..... | 7,028 | 6,368 | 4,957 | 1,411 | 660 | 285 | 4,202 | 2,039 | |
| West Virginia..... | 4,143 | 3,807 | 2,987 | 820 | 336 | 240 | 1,263 | | 2,040 |
| Wisconsin..... | 10,775 | 10,409 | 8,342 | 2,067 | 366 | 640 | 5,645 | 4,490 | |
| Wyoming..... | 773 | 570 | 439 | 131 | 3 | | 573 | | |
| Dist. of Columbia..... | 474 | 135 | 113 | 22 | 339 | 133 | | | 341 |
| Total..... | 322,630 | | | | | 15,134 | 208,880 | 60,399 | 38,217 |

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¹ These figures do not always agree with those shown on highway income tables because of time of disposition and use of fiscal years.

TABLE 580.—Gasoline taxes, 1928, as reported by State authorities

| State | Total tax earnings with refunds deducted | Disposition of total tax earnings | | | | | Gasoline consumed by motor vehicles | Tax rates per gallon |
|----------------------------------|--|-----------------------------------|-----------------------------|--------------------------|-------------------------------------|--------------------|-------------------------------------|----------------------|
| | | Collection costs | Construction, etc. | | State and county road bond payments | Miscellaneous uses | | |
| | | | State highways ¹ | Local roads ¹ | | | | |
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 gallons | Cents |
| Alabama..... | 6,614 | 35 | 2,726 | 3,296 | 557 | | 162,439 | 4 |
| Arizona..... | 2,018 | | 1,261 | 757 | | | 50,455 | 4 |
| Arkansas..... | 5,383 | 108 | 1,184 | 807 | 3,284 | | 106,148 | 5 |
| California..... | 29,567 | 46 | 19,681 | 9,840 | | | 985,550 | 3 |
| Colorado..... | 3,921 | 47 | 2,702 | 1,158 | | 14 | 130,708 | 3 |
| Connecticut..... | 3,512 | | 3,512 | | | | 173,438 | 2 |
| Delaware..... | 800 | | 800 | | | | 26,678 | 3 |
| Florida..... | 11,258 | 16 | 6,741 | 2,247 | | 2,254 | 224,705 | 5 |
| Georgia..... | 8,246 | 4 | 5,151 | 2,060 | | 1,031 | 206,137 | 4 |
| Idaho..... | 1,884 | 13 | 1,871 | | | | 47,097 | 4 |
| Illinois ² | 837 | | | | | 837 | 41,841 | 4 |
| Indiana..... | 11,178 | 19 | 7,439 | 2,790 | | 930 | 372,583 | 3 |
| Iowa..... | 8,536 | 23 | 3,447 | 5,066 | | | 284,521 | 3 |
| Kansas..... | 5,395 | | 4,517 | 878 | | | 269,742 | 2 |
| Kentucky..... | 6,743 | 23 | 6,720 | | | | 134,836 | 5 |
| Louisiana..... | 3,381 | | 3,381 | | | | 169,047 | 2 |
| Maine..... | 3,192 | 17 | 3,175 | | | | 79,011 | 4 |
| Maryland..... | 5,426 | 2 | 4,339 | | | 1,085 | 135,647 | 4 |
| Massachusetts ³ | No tax. | | | | | | No tax. | |
| Michigan..... | 18,335 | 90 | 9,499 | 5,400 | 3,000 | 346 | 611,161 | 3 |
| Minnesota..... | 5,768 | | 5,768 | | | | 288,405 | 2 |
| Mississippi..... | 5,697 | 6 | 2,591 | 2,885 | | 215 | 136,334 | 5 |
| Missouri..... | 6,948 | 57 | 6,891 | | | | 347,411 | 2 |
| Montana..... | 1,683 | 10 | 1,673 | | | | 56,114 | 3 |
| Nebraska..... | 3,941 | 7 | 3,934 | | | | 197,058 | 2 |
| Nevada..... | 531 | | 266 | 265 | | | 13,280 | 4 |
| New Hampshire..... | 1,884 | 1 | 1,412 | | | 471 | 47,080 | 4 |
| New Jersey..... | 8,470 | 12 | 8,368 | | | 90 | 422,347 | 2 |
| New Mexico..... | 1,852 | 37 | 1,415 | | 400 | | 36,738 | 5 |
| New York ³ | No tax. | | | | | | No tax. | |
| North Carolina..... | 9,787 | 10 | 6,869 | | 2,908 | | 244,675 | 4 |
| North Dakota..... | 1,479 | 25 | 1,454 | | | | 73,973 | 2 |
| Ohio..... | 24,886 | | 15,761 | 4,148 | | 4,977 | 829,523 | 3 |
| Oklahoma..... | 8,148 | | 5,432 | 2,716 | | | 279,997 | 3 |
| Oregon..... | 4,008 | 9 | 3,969 | | | | 144,285 | 3 |
| Pennsylvania..... | 21,998 | | 14,123 | 4,708 | 3,167 | | 733,269 | 3 |
| Rhode Island..... | 1,182 | | 887 | | 295 | | 59,116 | 2 |
| South Carolina..... | 5,518 | | 3,311 | 1,655 | 552 | | 110,365 | 5 |
| South Dakota..... | 3,159 | 8 | 2,210 | | 941 | | 78,966 | 4 |
| Tennessee..... | 5,135 | 51 | 5,084 | | | | 171,153 | 3 |
| Texas..... | 17,945 | | 13,459 | | | 4,486 | 681,135 | 2 |
| Utah..... | 1,665 | 6 | 1,143 | | 516 | | 47,577 | 3½ |
| Vermont..... | 1,119 | | 1,119 | | | | 37,311 | 3 |
| Virginia..... | 8,616 | | 5,744 | 2,872 | | | 174,801 | 5 |
| Washington..... | 4,207 | | 4,207 | | | | 210,326 | 2 |
| West Virginia..... | 4,308 | | 2,308 | | 2,000 | | 107,547 | 4 |
| Wisconsin..... | 6,857 | 10 | 2,521 | 3,833 | | 493 | 342,838 | 2 |
| Wyoming..... | 954 | 2 | 952 | | | | 31,811 | 3 |
| District of Columbia..... | 1,263 | | | | | 1,263 | 63,157 | 2 |
| Total..... | 305,234 | 694 | 211,047 | 57,381 | 17,620 | 18,492 | 10,178,345 | 3 |

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¹ These figures do not always agree with those shown on highway income tables because of time of disposition and use of fiscal years.² Only receipts for month of January, as law was found invalid by Supreme Court, Feb. 24, 1928.³ Gasoline tax law not effective until Jan. 1, 1929, in Massachusetts, and May 1, 1929, in New York.

TABLE 581.—Quarterly and annual average rate in cents per hour, by geographic divisions, for common labor employed on Federal-aid projects, 1922-1928

| Year and quarter ending— | New England | Middle Atlantic | East North Central | West North Central | South Atlantic | East South Central | West South Central | Mountain | Pacific | United States |
|--------------------------|-------------|-----------------|--------------------|--------------------|----------------|--------------------|--------------------|----------|---------|---------------|
| 1922 | | | | | | | | | | |
| March..... | 30 | 33 | 26 | 30 | 18 | 19 | 24 | 34 | 47 | 28 |
| June..... | 37 | 33 | 30 | 30 | 21 | 20 | 24 | 36 | 48 | 31 |
| September..... | 41 | 37 | 33 | 32 | 23 | 21 | 25 | 39 | 50 | 34 |
| December..... | 43 | 41 | 35 | 32 | 21 | 20 | 23 | 40 | 49 | 34 |
| Average..... | 40 | 37 | 33 | 32 | 21 | 20 | 24 | 38 | 49 | 33 |
| 1923 | | | | | | | | | | |
| March..... | 45 | 41 | 32 | 29 | 19 | 20 | 23 | 38 | 47 | 33 |
| June..... | 53 | 46 | 40 | 35 | 29 | 23 | 24 | 41 | 52 | 38 |
| September..... | 53 | 48 | 42 | 37 | 28 | 23 | 25 | 40 | 56 | 40 |
| December..... | 54 | 48 | 42 | 37 | 29 | 24 | 26 | 43 | 59 | 40 |
| Average..... | 53 | 47 | 41 | 36 | 27 | 23 | 25 | 41 | 54 | 39 |
| 1924 | | | | | | | | | | |
| March..... | 53 | 50 | 41 | 35 | 29 | 23 | 26 | 39 | 51 | 39 |
| June..... | 51 | 47 | 40 | 35 | 28 | 25 | 26 | 42 | 53 | 39 |
| September..... | 49 | 42 | 40 | 38 | 28 | 24 | 28 | 41 | 53 | 38 |
| December..... | 47 | 41 | 40 | 37 | 29 | 24 | 28 | 39 | 53 | 38 |
| Average..... | 49 | 43 | 40 | 36 | 28 | 24 | 27 | 40 | 53 | 38 |
| 1925 | | | | | | | | | | |
| March..... | 46 | 40 | 36 | 39 | 24 | 24 | 28 | 40 | 52 | 37 |
| June..... | 46 | 43 | 37 | 38 | 29 | 25 | 25 | 45 | 53 | 38 |
| September..... | 47 | 43 | 37 | 36 | 28 | 25 | 26 | 45 | 52 | 38 |
| December..... | 46 | 46 | 36 | 37 | 26 | 25 | 28 | 45 | 52 | 38 |
| Average..... | 46 | 43 | 37 | 37 | 27 | 25 | 26 | 44 | 52 | 38 |
| 1926 | | | | | | | | | | |
| March..... | 50 | 45 | 38 | 36 | 28 | 26 | 26 | 43 | 52 | 36 |
| June..... | 48 | 45 | 38 | 36 | 28 | 25 | 27 | 45 | 53 | 38 |
| September..... | 48 | 47 | 37 | 36 | 30 | 25 | 27 | 44 | 52 | 39 |
| December..... | 50 | 48 | 40 | 36 | 30 | 24 | 28 | 42 | 52 | 39 |
| Average..... | 49 | 47 | 38 | 36 | 29 | 25 | 27 | 44 | 52 | 38 |
| 1927 | | | | | | | | | | |
| March..... | 47 | 48 | 40 | 37 | 29 | 24 | 27 | 42 | 52 | 38 |
| June..... | 50 | 46 | 38 | 38 | 27 | 25 | 31 | 44 | 52 | 40 |
| September..... | 49 | 47 | 38 | 37 | 28 | 25 | 30 | 46 | 53 | 40 |
| December..... | 49 | 46 | 40 | 37 | 27 | 25 | 31 | 47 | 54 | 40 |
| Average..... | 49 | 47 | 39 | 37 | 28 | 25 | 30 | 45 | 53 | 40 |
| 1928 | | | | | | | | | | |
| March..... | 52 | 48 | 41 | 38 | 22 | 26 | 27 | 42 | 52 | 38 |
| June..... | 49 | 43 | 38 | 36 | 26 | 26 | 29 | 46 | 52 | 40 |
| September..... | 48 | 42 | 38 | 38 | 26 | 25 | 27 | 49 | 53 | 42 |
| December..... | 51 | 42 | 40 | 39 | 28 | 26 | 30 | 45 | 52 | 41 |
| Average..... | 49 | 43 | 39 | 38 | 26 | 26 | 28 | 46 | 52 | 41 |
| 1929 | | | | | | | | | | |
| March..... | 51 | 45 | 43 | 38 | 22 | 26 | 31 | 43 | 52 | 37 |
| June..... | 51 | 42 | 39 | 37 | 29 | 26 | 31 | 46 | 53 | 40 |
| September..... | 51 | 43 | 39 | 37 | 30 | 25 | 31 | 48 | 53 | 40 |

TABLE 582.—Gas tractors manufactured and sold: 1909 to 1928 ¹

| Year | Number manufactured in United States ² | | | | Sold in United States ³ | | | | Sold for export ⁴ | | | |
|------|---|--------------|---------|---------------------------------------|------------------------------------|--------------|---------|---------------------------------------|------------------------------|------------------|--------|---------------------------------------|
| | Wheel and track-laying types | | | Garden tractors and motor cultivators | Wheel and track-laying types | | | Garden tractors and motor cultivators | Wheel and track-laying types | | | Garden tractors and motor cultivators |
| | Wheel | Track-laying | Total | | Wheel | Track-laying | Total | | Wheel | Track-laying | Total | |
| 1909 | | | 2,000 | | | | | | | | | |
| 1910 | | | 4,000 | | | | | | | | | |
| 1911 | | | 7,000 | | | | | | | | | |
| 1912 | | | 11,500 | | | | | | | | | |
| 1913 | | | 7,000 | | | | | | | | | |
| 1914 | | | 15,000 | | | | | | | | | |
| 1915 | | | 21,000 | | | | | | | | | |
| 1916 | | | 29,670 | | | | 27,819 | | | | | |
| 1917 | | | 62,742 | | | | 49,504 | | | | 14,854 | |
| 1918 | | | 132,697 | | | | 96,470 | | | | 36,351 | |
| 1919 | | | 164,590 | | | | 136,162 | | | | 19,693 | |
| 1920 | | | 203,207 | 1,120 | | | 162,988 | 865 | | | 20,143 | 20 |
| 1921 | | | 68,029 | 6,780 | | | | 1,602 | | | | 1 |
| 1922 | 94,607 | 4,187 | 98,794 | 2,438 | 96,426 | 3,666 | 100,092 | 2,252 | 9,497 | 720 | 10,223 | 30 |
| 1923 | 126,906 | 5,032 | 131,908 | 4,676 | 110,690 | 4,350 | 115,040 | 5,045 | 15,793 | 815 | 16,608 | 51 |
| 1924 | 112,226 | 4,612 | 116,838 | 2,505 | 92,232 | 4,407 | 96,639 | 2,372 | 24,649 | 945 | 25,594 | 28 |
| 1925 | 158,037 | 6,060 | 164,097 | 3,456 | 114,160 | 4,579 | 118,739 | 3,259 | 45,073 | 703 | 45,776 | 148 |
| 1926 | 170,302 | 7,772 | 178,074 | 3,921 | 116,929 | 6,011 | 122,940 | 3,785 | 46,441 | 1,164 | 47,605 | 121 |
| 1927 | 184,594 | 10,319 | 194,913 | 5,591 | 147,123 | 8,720 | 155,843 | 4,794 | 41,998 | (⁵) | | 134 |
| 1928 | 152,296 | 19,203 | 171,469 | 4,465 | 86,930 | 12,890 | 99,820 | 4,073 | (⁵) | (⁵) | | 164 |

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¹ Some steam tractors may be included in number manufactured in 1909 to 1915, inclusive.² 1909 to 1915, inclusive, estimated. Data for 1916 to 1920, inclusive, collected by U. S. Department of Agriculture. (See U. S. D. A. Circular No. 212.) Data for 1921 to 1928, inclusive, collected by U. S. Department of Commerce. (See Manufacture and Sale of Farm Equipment reports published annually by the Bureau of the Census.)³ Sales data incomplete for 1916, 1921, 1927, and 1928.⁴ Motor cultivators not included in 1924.⁵ Not shown in Census reports.

TABLE 583.—Gas tractors sold in the United States and for export, 1922 to 1928, inclusive ¹

| Type of tractor | 1922 | | 1923 | | 1924 | | 1925 | | 1926 | | 1927 | | 1928 | |
|------------------------------|---------------------------|-----------------|---------------------------|-----------------|---------------------------|-----------------|---------------------------|-----------------|---------------------------|-----------------|---------------------------|------------------|---------------------------|------------------|
| | Sold in the United States | Sold for export | Sold in the United States | Sold for export | Sold in the United States | Sold for export | Sold in the United States | Sold for export | Sold in the United States | Sold for export | Sold in the United States | Sold for export | Sold in the United States | Sold for export |
| Wheel type: | | | | | | | | | | | | | | |
| 8 and less, belt horsepower | 544 | 82 | | | | | | | | | | | | |
| 9 and less, belt horsepower | | | 1,636 | 1,308 | | | | | | | | | | |
| 9 to 18, belt horsepower | 79,719 | 6,801 | | | | | | | | | | | | |
| 10 to 14, belt horsepower | | | 774 | 85 | | | | | | | | | | |
| 15 to 19, belt horsepower | | | 91,265 | 10,831 | | | | | | | | | | |
| 19 to 22, belt horsepower | 8,787 | 897 | | | | | | | | | | | | |
| Under 20, belt horsepower | | | | | 67,964 | 19,884 | 73,828 | 33,853 | 61,848 | 31,072 | | | | |
| 20 to 24, belt horsepower | 907 | 383 | 8,022 | 1,001 | 12,281 | 2,366 | 17,234 | 4,322 | 22,618 | 5,300 | | | | |
| Under 25, belt horsepower | | | | | | | | | | | | | | |
| 25 to 29, belt horsepower | | | 2,072 | 682 | 2,279 | 241 | 6,567 | 1,441 | 11,428 | 2,254 | | | | |
| 30 to 32, belt horsepower | 4,773 | 1,232 | | | | | | | | | | | | |
| 30 to 36, belt horsepower | | | 5,831 | 1,733 | 8,572 | 2,019 | 15,106 | 5,273 | 18,855 | 7,428 | | | | |
| 33 to 36, belt horsepower | 265 | 5 | | | | | | | | | | | | |
| 40 to 49, belt horsepower | | | 726 | 130 | 939 | 100 | 903 | 144 | 1,933 | 356 | | | | |
| 40 to 59, belt horsepower | 1,039 | 84 | | | | | | | | | | | | |
| 50 and over, belt horsepower | | | 335 | 23 | 197 | 9 | 432 | 40 | 247 | 31 | | | | |
| 60 and over, belt horsepower | 372 | 13 | | | | | | | | | | | | |
| Total wheel type | 96,426 | 9,497 | 110,690 | 15,793 | 92,232 | 24,649 | 114,160 | 45,073 | 116,929 | 46,441 | 147,123 | 41,367 | 86,930 | 45,157 |
| Garden type | 1,100 | 9 | | | 2,372 | 28 | 3,259 | 148 | 3,785 | 121 | 4,794 | 134 | 4,073 | 164 |
| Motor cultivators | 1,132 | 21 | | | | | | | | | | | | |
| Tractor-cultivators | 3,666 | 736 | | | 4,407 | 945 | 4,579 | 703 | 6,011 | 1,164 | 8,730 | (²) | 12,890 | (²) |
| Total tractors | 102,344 | 10,253 | 120,085 | 16,659 | 99,011 | 25,622 | 121,998 | 45,924 | 126,725 | 47,736 | 160,637 | (²) | 103,893 | (²) |

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¹ Manufacture and Sale of Farm Equipment reports published annually by the Bureau of the Census, U. S. Department of Commerce.² May include some garden tractors and motor cultivators.³ Not shown in census reports.⁴ Excludes 431 wheel-type tractors not shown by size.⁵ Does not include sizes 50 and over.⁶ Motor cultivators not included in 1924; combined with garden tractors from 1925 to 1928, inclusive.

TABLE 584.—*Tractors, horses, and mules on farms, 1920, 1925, and 1929*

| States | Tractors | | | Horses and mules | | | | | |
|---------------------|-------------------|-------------------|-------------------|----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | 1920 ¹ | 1925 ² | 1929 ³ | 2 years old and over | | | Total | | |
| | | | | 1920 ¹ | 1925 ² | 1929 ⁴ | 1920 ¹ | 1925 ² | 1929 ⁴ |
| New England: | | | | | | | | | |
| Maine..... | 635 | 1,774 | 3,204 | 91,111 | 81,346 | 71,000 | 94,794 | 82,604 | 72,000 |
| New Hampshire..... | 207 | 531 | 940 | 36,921 | 31,268 | 24,000 | 38,442 | 31,740 | 24,000 |
| Vermont..... | 444 | 1,568 | 2,972 | 73,253 | 61,982 | 52,000 | 77,832 | 63,504 | 53,000 |
| Massachusetts..... | 592 | 2,212 | 4,215 | 49,275 | 43,473 | 35,000 | 50,937 | 44,062 | 35,000 |
| Rhode Island..... | 79 | 318 | 612 | 6,418 | 5,402 | 4,000 | 6,615 | 5,461 | 4,000 |
| Connecticut..... | 440 | 1,441 | 2,686 | 38,025 | 34,551 | 27,000 | 38,904 | 34,937 | 27,000 |
| Middle Atlantic: | | | | | | | | | |
| New York..... | 7,497 | 25,681 | 48,299 | 516,944 | 439,366 | 381,000 | 543,494 | 447,265 | 388,000 |
| New Jersey..... | 946 | 4,419 | 8,681 | 76,268 | 61,170 | 54,000 | 78,326 | 62,103 | 55,000 |
| Pennsylvania..... | 5,697 | 19,764 | 37,260 | 525,426 | 449,728 | 389,000 | 561,047 | 462,698 | 400,000 |
| E. N. Central: | | | | | | | | | |
| Ohio..... | 10,469 | 30,905 | 56,534 | 767,507 | 634,223 | 527,000 | 842,318 | 662,843 | 552,000 |
| Indiana..... | 9,230 | 23,567 | 41,705 | 718,390 | 624,406 | 576,000 | 817,591 | 657,054 | 618,000 |
| Illinois..... | 23,102 | 43,325 | 69,973 | 1,249,189 | 1,113,485 | 908,000 | 1,465,126 | 1,197,669 | 983,000 |
| Michigan..... | 5,884 | 19,217 | 35,950 | 568,978 | 474,593 | 401,000 | 611,393 | 489,420 | 416,000 |
| Wisconsin..... | 9,407 | 29,651 | 54,664 | 631,934 | 585,317 | 530,000 | 687,648 | 610,666 | 551,000 |
| W. N. Central: | | | | | | | | | |
| Minnesota..... | 15,503 | 26,739 | 41,849 | 834,088 | 798,945 | 746,000 | 943,032 | 847,281 | 801,000 |
| Iowa..... | 20,270 | 37,230 | 59,609 | 1,250,004 | 1,162,783 | 1,030,000 | 1,468,042 | 1,276,830 | 1,130,000 |
| Missouri..... | 7,889 | 12,745 | 19,398 | 1,043,046 | 986,173 | 809,000 | 1,295,265 | 1,079,690 | 887,000 |
| North Dakota..... | 13,006 | 17,483 | 24,156 | 719,384 | 685,629 | 543,000 | 863,555 | 740,584 | 619,000 |
| South Dakota..... | 12,939 | 17,426 | 24,102 | 672,881 | 667,044 | 553,000 | 832,151 | 741,409 | 655,000 |
| Nebraska..... | 11,100 | 18,765 | 29,062 | 878,815 | 901,201 | 789,000 | 1,061,243 | 982,330 | 870,000 |
| Kansas..... | 17,177 | 31,171 | 49,681 | 1,061,401 | 1,080,778 | 859,000 | 1,326,159 | 1,191,446 | 964,000 |
| South Atlantic: | | | | | | | | | |
| Delaware..... | 239 | 694 | 1,263 | 35,084 | 31,000 | 27,000 | 37,191 | 31,947 | 28,000 |
| Maryland..... | 1,525 | 4,026 | 7,179 | 159,382 | 138,762 | 117,000 | 173,962 | 147,444 | 125,000 |
| Dist. Columbia..... | 1 | 8 | 27 | 340 | 261 | 279 | 343 | 279 | 279 |
| Virginia..... | 2,379 | 6,750 | 12,283 | 371,128 | 345,419 | 288,000 | 409,295 | 362,664 | 303,000 |
| West Virginia..... | 572 | 1,860 | 4,493 | 167,524 | 149,234 | 120,000 | 184,129 | 157,737 | 138,000 |
| North Carolina..... | 2,277 | 7,909 | 15,431 | 411,022 | 406,385 | 368,000 | 428,005 | 410,730 | 374,000 |
| South Carolina..... | 1,304 | 2,906 | 4,958 | 289,412 | 245,105 | 215,000 | 297,681 | 248,194 | 217,000 |
| Georgia..... | 2,252 | 4,145 | 8,813 | 495,479 | 395,287 | 382,000 | 506,874 | 398,052 | 386,000 |
| Florida..... | 680 | 2,777 | 5,352 | 76,497 | 69,292 | 65,000 | 80,616 | 71,604 | 67,000 |
| E. S. Central: | | | | | | | | | |
| Kentucky..... | 2,029 | 4,994 | 8,759 | 592,615 | 570,419 | 533,000 | 675,299 | 601,232 | 570,000 |
| Tennessee..... | 1,872 | 4,767 | 8,674 | 575,167 | 558,210 | 489,000 | 670,431 | 594,684 | 523,000 |
| Alabama..... | 811 | 2,465 | 4,546 | 404,769 | 381,414 | 384,000 | 426,600 | 390,172 | 392,000 |
| Mississippi..... | 667 | 1,871 | 3,477 | 481,192 | 442,484 | 420,000 | 523,068 | 458,931 | 436,000 |
| W. S. Central: | | | | | | | | | |
| Arkansas..... | 1,822 | 3,476 | 5,687 | 519,530 | 504,348 | 454,000 | 574,603 | 522,843 | 475,000 |
| Louisiana..... | 2,812 | 3,482 | 4,600 | 331,778 | 292,884 | 257,000 | 358,871 | 304,827 | 269,000 |
| Oklahoma..... | 6,210 | 10,950 | 17,259 | 881,927 | 897,623 | 781,000 | 1,075,078 | 978,247 | 840,000 |
| Texas..... | 9,048 | 16,780 | 27,238 | 1,662,551 | 1,747,305 | 1,705,000 | 1,837,294 | 1,848,308 | 1,801,000 |
| Mountain: | | | | | | | | | |
| Montana..... | 7,647 | 6,602 | 14,000 | 512,187 | 515,569 | 448,000 | 678,185 | 604,625 | 526,000 |
| Idaho..... | 1,587 | 1,927 | 2,491 | 243,261 | 215,253 | 193,000 | 300,858 | 240,391 | 217,000 |
| Wyoming..... | 1,075 | 1,323 | 1,728 | 146,935 | 170,578 | 164,000 | 201,710 | 204,666 | 191,000 |
| Colorado..... | 4,990 | 6,693 | 9,237 | 358,252 | 362,864 | 305,000 | 451,829 | 403,498 | 340,000 |
| New Mexico..... | 491 | 1,080 | 1,833 | 167,550 | 188,033 | 188,000 | 203,055 | 217,410 | 193,000 |
| Arizona..... | 930 | 1,239 | 1,707 | 111,751 | 105,113 | 89,000 | 148,159 | 123,735 | 102,000 |
| Utah..... | 583 | 850 | 1,228 | 101,649 | 99,421 | 89,000 | 128,264 | 113,865 | 104,000 |
| Nevada..... | 210 | 221 | 255 | 40,337 | 45,195 | 38,000 | 52,936 | 54,312 | 45,000 |
| Pacific: | | | | | | | | | |
| Washington..... | 2,635 | 4,490 | 6,979 | 274,877 | 249,001 | 216,000 | 319,472 | 268,516 | 234,000 |
| Oregon..... | 3,070 | 5,768 | 9,319 | 234,873 | 219,742 | 183,000 | 285,934 | 242,910 | 200,000 |
| California..... | 13,852 | 29,948 | 50,648 | 416,267 | 349,680 | 300,000 | 465,826 | 370,141 | 318,000 |
| United States..... | 246,063 | 505,933 | 852,989 | 21,872,594 | 20,618,744 | 18,116,000 | 25,199,552 | 22,081,520 | 19,470,000 |

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¹ 1920 census (Agriculture), U. S. Department of Commerce.² 1925 Census of Agriculture, U. S. Department of Commerce.³ Estimates of tractors on farms in spring of 1929 by Farm Implement News, Feb. 7, 1929.⁴ Estimates by Bureau of Agricultural Economics, U. S. D. A.⁵ Includes 3,338 horses in Montana and 11,207 horses in Arizona not classified in Census Report by age.

MISCELLANEOUS AGRICULTURAL STATISTICS

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TABLE 585.—*Hunters' licenses issued by States, with total money returns, for the seasons 1926-27 and 1927-28*

| State | Licenses issued | | | | | | Money returns ¹ | |
|---------------------|----------------------|----------------------|-----------------------|--------------------|-----------|-----------|----------------------------|----------------|
| | Resident | | Nonresident and alien | | Total | | 1926-27 | 1927-28 |
| | 1926-27 | 1927-28 | 1926-27 | 1927-28 | 1926-27 | 1927-28 | | |
| | | | | | | | <i>Dollars</i> | <i>Dollars</i> |
| Alaska ² | | | 182 | 268 | 182 | 268 | 12,860.00 | 18,870.00 |
| Alabama | 54,635 | 86,843 | 131 | 201 | 54,766 | 87,044 | 83,494.24 | 99,858.00 |
| Arizona | 30,000 | 38,134 | 400 | 631 | 30,400 | 38,765 | 45,000.00 | 52,449.35 |
| Arkansas | 90,000 | 100,000 | | 1,600 | 90,000 | 101,500 | 90,000.00 | 117,500.00 |
| California | 250,891 | 223,109 | 2,641 | 2,587 | 253,532 | 228,696 | 279,701.00 | 464,145.00 |
| Colorado | ³ 90,999 | ³ 107,305 | 365 | 420 | 91,364 | 107,725 | 205,237.45 | 227,612.50 |
| Connecticut | 37,521 | 37,212 | 599 | 712 | 38,120 | 37,924 | 111,070.50 | 103,402.00 |
| Delaware | ³ 2,115 | ³ 1,970 | 356 | 344 | 2,471 | 2,314 | 6,064.50 | 5,410.00 |
| Florida | 59,679 | 59,440 | 709 | 581 | 60,388 | 60,021 | 163,105.00 | 223,154.25 |
| Georgia | 64,755 | 79,592 | 226 | 211 | 64,981 | 79,803 | 79,155.00 | 108,781.84 |
| Idaho | ³ 70,500 | ³ 75,730 | 568 | 352 | 71,068 | 76,082 | 113,357.75 | 150,567.85 |
| Illinois | 286,908 | 303,567 | 1,691 | 1,500 | 288,599 | 305,067 | 231,198.02 | 319,317.00 |
| Indiana | ³ 251,226 | ³ 310,204 | 449 | ³ 617 | 251,675 | 310,721 | 232,930.20 | 287,058.80 |
| Iowa | ³ 161,008 | ³ 164,647 | 290 | 363 | 161,298 | 165,010 | 163,908.00 | 168,277.00 |
| Kansas | 113,526 | 115,185 | 129 | 92 | 113,655 | 115,257 | 115,461.00 | 108,545.00 |
| Kentucky | 96,954 | 108,202 | 62 | 79 | 97,016 | 108,281 | 78,850.00 | 109,031.50 |
| Louisiana | 106,210 | 102,411 | 262 | 242 | 106,472 | 102,653 | 126,067.00 | 108,536.00 |
| Maine | ³ 37,241 | ³ 39,979 | 54 | 3,544 | 37,295 | 43,523 | 62,913.35 | 71,878.55 |
| Maryland | 62,869 | 69,025 | 2,117 | 1,841 | 64,986 | 70,866 | 117,420.55 | 132,834.55 |
| Massachusetts | 108,746 | 107,615 | 2,621 | 2,881 | 111,367 | 110,496 | 234,556.00 | 231,427.00 |
| Michigan | 293,081 | 302,808 | 2,385 | 2,465 | 295,469 | 305,273 | 379,003.20 | 530,196.48 |
| Minnesota | 172,000 | 118,001 | 400 | 234 | 172,400 | 118,235 | 240,000.00 | 127,497.40 |
| Missouri | ³ 255,426 | ³ 231,101 | 3,998 | ³ 780 | 259,424 | 231,800 | 313,265.48 | 275,908.12 |
| Montana | ³ 67,078 | ³ 75,063 | ³ 3,578 | 261 | 70,656 | 75,324 | 145,104.30 | 155,738.00 |
| Nebraska | ³ 146,246 | ³ 163,447 | ³ 474 | ³ 133 | 146,720 | 163,580 | 150,995.25 | 166,772.00 |
| Nevada | 5,506 | 5,327 | 60 | 151 | 5,566 | 5,478 | 8,250.00 | 9,410.50 |
| New Hampshire | ³ 52,647 | ³ 55,401 | ³ 2,305 | ³ 2,319 | 54,952 | 57,720 | 105,648.45 | 109,576.35 |
| New Jersey | ³ 167,415 | ³ 183,280 | ³ 1,787 | ³ 1,941 | 169,202 | 185,221 | 232,093.25 | 266,427.10 |
| New Mexico | 16,399 | ³ 15,971 | 723 | ³ 1,444 | 17,122 | 17,415 | 49,388.45 | 79,660.25 |
| New York | 615,344 | ³ 670,441 | 5,070 | ³ 5,339 | 620,414 | 675,780 | 822,415.00 | 699,873.52 |
| North Carolina | 137,069 | 144,271 | 876 | 994 | 137,975 | 145,268 | 203,000.00 | 207,900.00 |
| North Dakota | 34,238 | 35,108 | 160 | 163 | 34,398 | 35,271 | 51,943.70 | 53,377.00 |
| Ohio | 363,000 | 368,377 | | 108 | 363,000 | 368,485 | 453,750.00 | 369,997.00 |
| Oklahoma | ³ 80,160 | 153,001 | 154 | 331 | 80,323 | 153,332 | 82,416.50 | 157,018.00 |
| Oregon | 54,922 | ³ 57,407 | 748 | ³ 779 | 55,670 | 58,183 | 202,395.00 | 210,711.75 |
| Pennsylvania | 520,574 | 515,948 | 3,505 | 1,781 | 524,079 | 517,729 | 649,549.10 | 1,003,159.70 |
| Rhode Island | 13,213 | 10,342 | 274 | 243 | 13,487 | 10,585 | 10,313.00 | 21,527.00 |
| South Carolina | 68,048 | 111,070 | 1,065 | 1,294 | 69,113 | 112,364 | 116,466.65 | 167,590.00 |
| South Dakota | 91,924 | ³ 101,508 | 1,464 | 2,680 | 93,388 | 104,188 | 133,136.00 | 174,938.00 |
| Tennessee | 45,000 | 63,026 | 200 | 280 | 45,200 | 63,303 | 63,000.00 | 78,527.32 |
| Texas | 83,707 | 104,703 | 397 | 488 | 84,104 | 105,191 | 163,540.95 | 221,606.00 |
| Utah | ³ 52,942 | ³ 40,792 | ³ 98 | ³ 140 | 53,040 | 40,932 | 116,944.73 | 93,663.00 |
| Vermont | ³ 37,049 | ³ 37,208 | ³ 1,128 | ³ 1,058 | 38,177 | 38,268 | 53,454.15 | 54,711.30 |
| Virginia | 95,054 | 110,133 | 2,194 | 2,565 | 97,249 | 118,698 | 154,212.60 | 199,637.40 |
| Washington | ³ 196,213 | ³ 201,372 | ³ 729 | ³ 703 | 196,942 | 202,075 | 358,656.00 | 371,356.00 |
| West Virginia | ³ 127,305 | ³ 141,706 | 235 | 445 | 127,540 | 142,151 | 130,830.00 | 148,381.00 |
| Wisconsin | 155,843 | 172,667 | 231 | 462 | 156,074 | 173,129 | 146,046.10 | 189,892.00 |
| Wyoming | ³ 23,885 | ³ 24,822 | ³ 592 | 645 | 24,477 | 25,467 | 63,000.00 | 69,507.50 |
| Total ⁴ | 5,941,113 | 6,413,454 | 48,682 | 49,101 | 5,989,795 | 6,462,555 | 8,187,223.82 | 9,338,173.88 |

Bureau of Biological Survey.

¹ Includes amounts received from combined hunting and fishing licenses, but not from licenses to fish only.

² No resident license required.

³ Combined hunting and fishing license.

⁴ Totals are exclusive of Mississippi, for which figures are not available, and include figures for combined hunting and fishing licenses, which for many States can not be separated, many such licenses being taken out by anglers only.

TABLE 586.—National forest areas, by districts, June 30, 1929

| District | Name | District headquarters | Gross area | Alienated lands | Net area |
|----------|-------------------------------|---------------------------|--------------|-----------------|--------------|
| | | | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> |
| 1 | Northern district..... | Missoula, Mont..... | 26,781,219 | 3,966,338 | 22,814,881 |
| 2 | Rocky Mountain district..... | Denver, Colo..... | 20,967,083 | 1,784,282 | 19,172,801 |
| 3 | Southwestern district..... | Albuquerque, N. Mex..... | 21,458,169 | 2,223,123 | 19,235,046 |
| 4 | Intermountain district..... | Ogden, Utah..... | 30,685,614 | 1,177,196 | 29,508,418 |
| 5 | California district..... | San Francisco, Calif..... | 24,149,650 | 4,950,019 | 19,199,631 |
| 6 | North Pacific district..... | Portland, Oreg..... | 26,847,201 | 3,865,155 | 22,982,046 |
| 7 | Eastern district..... | Washington, D. C..... | 9,732,694 | 5,553,648 | 4,179,046 |
| 8 | Alaska district..... | Juneau, Alaska..... | 21,397,515 | 51,590 | 21,345,925 |
| 9 | Lake States district..... | Milwaukee, Wis..... | 2,555,808 | 1,253,082 | 1,302,726 |
| | Total of the 9 districts..... | | 184,564,953 | 24,814,433 | 159,750,520 |

DISTRICT HEADQUARTERS

DISTRICT 1.—Northern District: Office, Federal Building, Missoula, Mont. Embracing Montana, northeastern Washington, northern Idaho, and northwestern South Dakota.

DISTRICT 2.—Rocky Mountain District: Office, Federal Building, Denver, Colo. Embracing Colorado, Wyoming, South Dakota, Nebraska, Oklahoma, and Illinois.

DISTRICT 3.—Southwestern District: Office, Gas and Electric Building, Albuquerque, N. Mex. Embracing Arizona and New Mexico.

DISTRICT 4.—Intermountain District: Office, Forest Service Building, Ogden, Utah. Embracing Utah, southern Idaho, western Wyoming, Nevada, and northwestern Arizona.

DISTRICT 5.—California District: Office, Ferry Building, San Francisco, Calif. Embracing California and southwestern Nevada.

DISTRICT 6.—North Pacific District: Office, Post Office Building, Portland, Oreg. Embracing Washington and Oregon.

DISTRICT 7.—Eastern District: Office, Atlantic Building, Washington, D. C. Embracing Alabama, Arkansas, Florida, Georgia, Maine, New Hampshire, North Carolina, Pennsylvania, Porto Rico, South Carolina, Tennessee, Virginia, and West Virginia.

DISTRICT 8.—Alaska District: Office, Goldstein Building, Juneau, Alaska. Located in Alaska.

DISTRICT 9.—Lake States District: Office, Customs Service Building, Milwaukee, Wis. Embracing Michigan and Minnesota.

NATIONAL MONUMENTS

The following national monuments situated within national forests and administered by the Department of Agriculture have been created under the act of June 8, 1906 (34 Stat. 225), for the preservation of objects of historic or scientific interest:

| Name | National forest | State | Area | Latest change in boundary |
|---------------------------|-----------------|-------------------|--------------|---------------------------|
| | | | <i>Acres</i> | |
| Bandelier..... | Santa Fe..... | New Mexico..... | 22,075 | Feb. 11, 1916 |
| Chiricahua..... | Coronado..... | Arizona..... | 4,480 | Apr. 18, 1924 |
| Devil Postpile..... | Sierra..... | California..... | 800 | July 6, 1911 |
| Gila Cliff Dwellings..... | Gila..... | New Mexico..... | 160 | Nov. 16, 1907 |
| Holy Cross..... | Holy Cross..... | Colorado..... | 1,392 | May 11, 1929 |
| Jewel Cave..... | Harney..... | South Dakota..... | 1,280 | Feb. 7, 1908 |
| Lava Beds..... | Modoc..... | California..... | 45,967 | Nov. 21, 1925 |
| Lehman Caves..... | Nevada..... | Nevada..... | 593 | Jan. 24, 1922 |
| Mount Olympus..... | Olympic..... | Washington..... | 298,730 | Jan. 7, 1929 |
| Old Kasaan..... | Tongass..... | Alaska..... | 38 | Oct. 25, 1916 |
| Oregon Caves..... | Siskiyou..... | Oregon..... | 480 | July 12, 1909 |
| Timpanogos Cave..... | Wasatch..... | Utah..... | 250 | Oct. 14, 1922 |
| Tonto..... | Tonto..... | Arizona..... | 640 | Dec. 19, 1907 |
| Walnut Canyon..... | Cocconino..... | do..... | 960 | Nov. 30, 1915 |
| Wheeler..... | Cochetopa..... | Colorado..... | 300 | Dec. 7, 1908 |
| | Rio Grande..... | | | |
| Total area..... | | | 378,145 | |

NATIONAL GAME REFUGES

The following national refuges situated wholly or in part within national forests have been designated under special acts of Congress for the protection of game:

| Name | National forest | State | Area | Latest change in boundary |
|--------------------------------------|-------------------|----------------|------------------------|---------------------------|
| Cherokee National Game Refuge No. 1. | Cherokee | Tennessee | <i>Acres</i> 30,000 | Aug. 5, 1924 |
| Cherokee National Game Refuge No. 2. | do. | Georgia | 14,000 | Do. |
| Custer State Park Game Sanctuary. | Harney | South Dakota | 44,840 | Jan. 14, 1929 |
| Grand Canyon | Tusayan Kaibab | Arizona | 792,163 | Feb. 26, 1919 |
| Ozark National Game Refuge No. 1. | Ozark | Arkansas | 8,420 | Apr. 26, 1926 |
| Ozark National Game Refuge No. 2. | do. | do. | 5,300 | Do. |
| Ozark National Game Refuge No. 3. | do. | do. | 3,620 | Do. |
| Ozark National Game Refuge No. 4. | do. | do. | 4,160 | Do. |
| Pisgah | Pisgah | North Carolina | 98,381 | Oct. 17, 1916 |
| Sequoia | Sequoia | California | 16,300 | July 3, 1926 |
| Sheep Mountain | Medicine Bow | Wyoming | 28,318 | Aug. 8, 1924 |
| Wichita | Wichita | Oklahoma | 60,800 | June 2, 1905 |

The following national forests, or parts of national forests, established under section 9 of the Clarke-McNary Act of June 7, 1924 (43 Stat. 653), were on July 1, 1925, designated game refuges by the acting Secretaries of War and Agriculture:

| National forest | State | Area |
|---------------------------------------|--------------|-----------------------|
| Black Hills (Mende district) | South Dakota | <i>Acres</i> 5,548 |
| Manzano (Zuni district) | New Mexico | 45,423 |
| Medicine Bow (Pole Mountain district) | Wyoming | 56,132 |
| Michigan (Brady district) | Michigan | 2,680 |

RANGE RESERVES

The following reserves have been established by Executive order for use by the Forest Service in conducting studies of grazing and range management:

| Name | State | Area | Latest change in boundary |
|------------|------------|-------------------------|---------------------------|
| Jornada | New Mexico | <i>Acres</i> 193,686 | July 10, 1925 |
| Santa Rita | Arizona | 52,399 | Mar. 2, 1927 |

TABLE 587.—Consumption of domestic lumber, 1928¹
[Thousand feet b. m.]

| State | Region | Softwoods | | | Hardwoods | | | All lumber | | |
|----------------------|------------|----------------------|---------------------------|------------------------------|----------------------|---------------------------|------------------------------|----------------------|---------------------------|------------------------------|
| | | Derived within State | Derived from other States | Total consumption (domestic) | Derived within State | Derived from other States | Total consumption (domestic) | Derived within State | Derived from other States | Total consumption (domestic) |
| Alabama | P. | 319,948 | 166,919 | 486,867 | 31,615 | 7,579 | 39,194 | 351,563 | 174,498 | 526,061 |
| Arizona | R. M. (S.) | 41,365 | 83,455 | 124,820 | 168,794 | 66,644 | 235,438 | 42,090 | 142,323 | 184,413 |
| Arkansas | S. P. | 120,992 | 44,295 | 165,287 | 54,304 | 54,304 | 108,592 | 289,786 | 110,809 | 400,595 |
| California | P. (S.) | 1,003,881 | 2,000,744 | 3,004,625 | 57 | 2,857 | 2,914 | 1,004,082 | 2,003,476 | 3,007,558 |
| Colorado | R. M. (S.) | 41,908 | 182,619 | 224,527 | 23,003 | 29,305 | 52,308 | 41,965 | 183,476 | 225,441 |
| Connecticut | N. | 4,798 | 203,462 | 208,260 | 2,335 | 1,886 | 4,221 | 27,801 | 232,757 | 260,558 |
| Delaware | N. | 3,505 | 40,569 | 44,074 | 45,488 | 1,983 | 47,471 | 3,740 | 47,471 | 51,211 |
| District of Columbia | N. | | | | | | | | | |
| Florida | P. | 378,961 | 16,715 | 395,676 | 13,334 | 6,196 | 19,530 | 392,265 | 22,911 | 415,176 |
| Georgia | S. P. | 205,262 | 316,965 | 522,227 | 40,134 | 7,741 | 47,875 | 245,396 | 117,344 | 362,740 |
| Idaho | R. M. (N.) | 143,768 | 67,203 | 210,971 | 19,855 | 202,002 | 221,857 | 143,770 | 17,203 | 160,973 |
| Illinois | C. | 21 | 1,783,759 | 1,783,780 | 76,321 | 30,966 | 107,287 | 20,202 | 2,226,314 | 2,246,516 |
| Indiana | P. | | 551,615 | 551,626 | 8,740 | 28,276 | 37,016 | 76,342 | 540,365 | 576,381 |
| Iowa | P. | | 509,409 | 509,409 | 710 | 28,276 | 28,986 | 8,740 | 540,365 | 549,105 |
| Kansas | P. | | 375,925 | 375,925 | 53,849 | 122,624 | 176,473 | 57,986 | 393,410 | 551,393 |
| Kentucky | P. | 4,137 | 270,786 | 274,923 | 170,645 | 70,827 | 241,472 | 177,216 | 229,783 | 407,000 |
| Louisiana | S. | 307,312 | 158,656 | 465,968 | 22,884 | 8,631 | 31,515 | 49,025 | 455,918 | 504,929 |
| Maine | N. | 154,332 | 46,331 | 200,663 | 13,464 | 47,959 | 61,423 | 70,043 | 627,141 | 697,564 |
| Maryland | N. | 35,561 | 407,959 | 443,520 | 10,679 | 104,350 | 115,029 | 462,154 | 1,162,033 | 1,277,062 |
| Massachusetts | N. | 59,364 | 522,791 | 582,155 | 368,467 | 373,535 | 742,002 | 167,003 | 54,962 | 696,965 |
| Michigan | N. | 93,687 | 788,498 | 882,185 | 48,659 | 63,883 | 112,542 | 391,912 | 1,523,844 | 1,636,331 |
| Minnesota | L. | 118,344 | 469,961 | 588,305 | 77,292 | 97,601 | 174,893 | 678,959 | 44,097 | 723,056 |
| Mississippi | P. | 314,620 | 25,763 | 340,383 | 52,276 | 97,601 | 149,877 | 80,224 | 71,164 | 150,991 |
| Missouri | S. C. | 27,948 | 581,338 | 609,306 | 77 | 7,693 | 7,770 | 192,319 | 303,770 | 311,540 |
| Montana | R. M. (N.) | 192,242 | 73,791 | 266,033 | | | | | | |
| Nebraska | P. | | 296,077 | 296,077 | | | | | | |
| Nevada | P. (S.) | 104 | 53,539 | 53,643 | | | | | | |
| New Hampshire | N. | 117,561 | 169,290 | 286,851 | 13,817 | 15,806 | 29,623 | 131,378 | 67,539 | 198,917 |
| New Jersey | N. | 102,102 | 588,121 | 690,223 | 3,118 | 77,748 | 80,866 | 3,220 | 667,869 | 671,089 |
| New Mexico | R. M. (S.) | 62,909 | 45,913 | 108,822 | 1,212 | 1,212 | 2,424 | 62,909 | 1,123 | 64,032 |
| New York | N. | 28,403 | 2,212,827 | 2,241,230 | 58,133 | 273,307 | 331,440 | 86,536 | 2,486,184 | 2,572,620 |
| North Carolina | N. C. P. | 330,138 | 102,863 | 433,001 | 81,783 | 103,336 | 185,099 | 411,801 | 296,229 | 708,030 |
| North Dakota | P. | | 136,262 | 136,262 | | | | | | |
| Ohio | C. | 120 | 1,093,890 | 1,094,010 | 82,247 | 289,361 | 371,608 | 82,247 | 1,363,231 | 1,445,449 |
| Oklahoma | S. P. | 101,085 | 336,280 | 437,365 | 5,605 | 10,364 | 15,969 | 106,690 | 3,644 | 110,334 |
| Oregon | P. (N.) | 948,000 | 81,796 | 1,029,796 | 10,290 | 4,355 | 14,645 | 938,020 | 86,151 | 1,024,171 |
| Pennsylvania | N. | 50,920 | 1,211,702 | 1,262,624 | 127,014 | 322,677 | 449,691 | 178,006 | 1,534,379 | 1,712,385 |
| Rhode Island | N. | | 145,591 | 145,591 | 625 | 6,035 | 6,660 | 1,145 | 151,626 | 152,771 |
| South Carolina | N. C. P. | 91,436 | 21,014 | 112,450 | 10,215 | 4,080 | 14,305 | 101,651 | 23,104 | 124,755 |

| | | | | | | | | |
|------------------------|-----------|------------|------------|-----------|-----------|-----------|------------|------------|
| South Dakota..... | 27,436 | 129,996 | 137,432 | 7,944 | 7,944 | 27,436 | 137,436 | 165,278 |
| Tennessee..... | 27,315 | 354,145 | 381,460 | 208,971 | 420,673 | 238,017 | 563,116 | 802,113 |
| Texas..... | 745,506 | 690,188 | 1,444,494 | 33,455 | 133,373 | 84,224 | 121,643 | 1,577,867 |
| Utah..... | 37,871 | 118,592 | 126,623 | 1,181 | 1,443 | 7,623 | 120,443 | 128,066 |
| Vermont..... | 96,874 | 21,960 | 39,435 | 3,927 | 29,161 | 63,109 | 28,487 | 88,596 |
| Virginia..... | 1,533,750 | 218,675 | 315,529 | 74,479 | 134,463 | 136,838 | 239,154 | 449,992 |
| Washington..... | 18,152 | 152,281 | 111,411 | 1,331 | 10,778 | 1,572,857 | 153,852 | 1,686,789 |
| West Virginia..... | 1,533,750 | 35,336 | 111,488 | 94,897 | 123,893 | 117,859 | 117,422 | 235,381 |
| Wisconsin..... | 203,302 | 473,209 | 682,511 | 81,946 | 323,514 | 444,860 | 561,165 | 1,006,025 |
| Wyoming..... | 24,077 | 110,372 | 134,449 | 214 | 220 | 24,083 | 110,586 | 134,669 |
| Total, all States..... | 8,034,806 | 18,234,542 | 26,269,348 | 2,343,548 | 3,354,996 | 5,698,544 | 21,589,538 | 31,967,892 |

SUMMARY BY LUMBER-PRODUCING REGIONS

| State | Region | Softwoods | | | Hardwoods | | | All lumber | | |
|-----------------------------|-----------------|-----------------------|----------------------------|------------|-----------------------|----------------------------|-----------|-----------------------|----------------------------|------------|
| | | Derived within region | Derived from other regions | Total | Derived within region | Derived from other regions | Total | Derived within region | Derived from other regions | Total |
| Northeastern Lake..... | N..... | 720,090 | 5,271,033 | 5,991,143 | 421,552 | 771,768 | 1,193,390 | 1,141,642 | 6,042,821 | 7,184,463 |
| Central..... | L..... | 588,009 | 1,694,332 | 2,182,001 | 396,466 | 378,582 | 1,178,058 | 1,385,535 | 1,945,524 | 3,331,059 |
| North Carolina pine..... | C..... | 182,924 | 1,244,965 | 4,896,829 | 222,245 | 1,070,924 | 1,693,267 | 1,104,367 | 3,695,819 | 5,389,086 |
| Southern pine..... | N. C. P..... | 612,010 | 4,244,965 | 4,896,829 | 222,245 | 1,070,924 | 1,693,267 | 1,104,367 | 3,695,819 | 5,389,086 |
| Pacific (north)..... | S. P..... | 3,867,023 | 388,189 | 4,053,207 | 812,745 | 106,627 | 3,934,877 | 4,470,788 | 346,727 | 4,817,577 |
| Pacific (south)..... | P. (N.)..... | 2,597,575 | 118,132 | 2,715,807 | 13,347 | 1,006 | 2,829,154 | 2,616,922 | 124,038 | 2,740,960 |
| Rocky Mountain (north)..... | P. (S.)..... | 1,028,727 | 2,020,532 | 3,048,259 | 70 | 54,304 | 3,123,133 | 2,028,928 | 2,083,845 | 4,112,773 |
| Rocky Mountain (south)..... | R. M. (N.)..... | 360,033 | 116,971 | 477,004 | 373 | 54,304 | 54,677 | 360,112 | 117,944 | 478,056 |
| Prairie..... | R. M. (S.)..... | 220,292 | 447,594 | 677,876 | 325 | 6,432 | 678,307 | 220,607 | 464,026 | 684,633 |
| Total..... | U. S..... | 10,022,016 | 16,247,332 | 26,269,348 | 3,213,683 | 2,484,831 | 5,698,544 | 13,235,709 | 18,732,183 | 31,967,892 |

Forest Service in cooperation with the Bureau of the Census.

† Preliminary figures.

TABLE 588.—*Production of lumber, by States, 1899, 1909, 1919, 1926-1928*

| State | 1899 | 1909 | 1919 | 1926 | 1927 | 1928 |
|---------------------|--------------------------|----------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | <i>M ft. b. m.</i> | <i>M ft. b. m.</i> | <i>M ft. b. m.</i> | <i>M ft. b. m.</i> | <i>M ft. b. m.</i> | <i>M ft. b. m.</i> |
| Alabama..... | 1,101,386 | 1,691,001 | 1,708,746 | 2,105,122 | 2,171,687 | 1,980,082 |
| Arizona..... | 36,182 | 62,731 | 73,655 | 115,232 | 169,085 | 158,047 |
| Arkansas..... | 1,623,987 | 2,111,300 | 1,772,157 | 1,441,018 | 1,229,481 | 1,129,731 |
| California..... | 737,035 | 1,143,507 | 1,259,363 | ¹ 2,187,959 | ¹ 2,070,811 | ¹ 1,952,659 |
| Colorado..... | 133,716 | 141,710 | 64,864 | 75,278 | 67,321 | 72,257 |
| Connecticut..... | 108,093 | 168,371 | 86,708 | 47,367 | 55,949 | 35,356 |
| Delaware..... | 35,955 | 65,440 | 27,437 | 9,433 | 16,824 | 13,161 |
| Florida..... | 790,373 | 1,201,734 | 1,137,432 | 920,545 | 907,128 | 905,072 |
| Georgia..... | 1,311,917 | 1,342,249 | 893,965 | 1,145,489 | 1,201,008 | 1,039,475 |
| Idaho..... | 65,363 | 615,800 | 765,388 | 917,471 | 923,986 | 977,468 |
| Illinois..... | 388,469 | 170,181 | 64,628 | 38,357 | 28,663 | 29,623 |
| Indiana..... | 1,036,999 | 556,418 | 282,487 | 139,472 | 148,492 | 126,790 |
| Iowa..... | 352,411 | 132,021 | 18,493 | (²) | (²) | (²) |
| Kansas..... | 10,665 | 4,716 | 2,840 | (²) | (²) | (²) |
| Kentucky..... | 774,651 | 860,712 | 512,078 | 216,759 | 197,618 | 174,340 |
| Louisiana..... | 1,115,366 | 3,551,918 | 3,163,871 | 2,889,530 | 2,385,724 | 2,278,422 |
| Maine..... | 784,647 | 1,111,565 | 596,116 | 340,893 | 263,818 | 266,523 |
| Maryland..... | 183,711 | 267,939 | 113,362 | 68,441 | 67,541 | 59,729 |
| Massachusetts..... | 344,190 | 361,200 | 166,841 | 86,168 | 88,298 | 112,299 |
| Michigan..... | 3,018,338 | 1,889,724 | 875,891 | 663,344 | 578,254 | 572,050 |
| Minnesota..... | 2,342,338 | 1,561,508 | 699,639 | 471,090 | 396,891 | 412,343 |
| Mississippi..... | 1,206,265 | 2,572,669 | 2,390,135 | 2,894,994 | 2,556,612 | 2,524,319 |
| Missouri..... | 723,754 | 660,159 | 321,383 | 178,568 | 189,136 | 141,990 |
| Montana..... | 255,685 | 308,582 | 287,378 | 378,698 | 396,267 | 387,879 |
| Nebraska..... | 4,655 | (²) | 505 | (²) | (²) | (²) |
| Nevada..... | 725 | (²) | 20,335 | (²) | (²) | (²) |
| New Hampshire..... | 572,447 | 649,606 | 338,777 | 213,007 | 215,912 | 239,261 |
| New Jersey..... | 74,118 | 61,620 | 36,898 | 6,953 | 5,044 | 3,220 |
| New Mexico..... | 30,880 | 91,987 | 86,808 | 127,110 | 172,517 | 162,030 |
| New York..... | 878,448 | 681,440 | 357,764 | 170,963 | 142,505 | 130,106 |
| North Carolina..... | 1,286,638 | 2,177,715 | 1,654,435 | 970,965 | 1,055,222 | 1,020,893 |
| Ohio..... | 990,497 | 542,904 | 280,076 | 141,499 | 127,880 | 112,229 |
| Oklahoma..... | 22,104 | 225,730 | 168,403 | 149,929 | 169,943 | 193,793 |
| Oregon..... | 734,538 | 1,898,995 | 2,577,403 | 4,454,735 | 3,992,852 | 4,371,924 |
| Pennsylvania..... | 2,333,278 | 1,462,771 | 630,471 | 318,797 | 277,722 | 238,615 |
| Rhode Island..... | 18,528 | 25,489 | 11,030 | 5,426 | 6,815 | 4,622 |
| South Carolina..... | 466,429 | 897,660 | 621,679 | 920,825 | 817,016 | 821,900 |
| South Dakota..... | ³ 33,734 | 31,057 | 42,970 | 49,281 | 46,909 | 53,967 |
| Tennessee..... | 950,958 | 1,223,849 | 792,132 | 683,323 | 595,297 | 530,306 |
| Texas..... | 1,232,404 | 2,099,130 | 1,379,771 | 1,456,121 | 1,446,460 | 1,446,686 |
| Utah..... | 17,548 | 12,638 | 11,917 | 6,479 | 6,152 | 7,623 |
| Vermont..... | 375,809 | 351,571 | 218,479 | 111,638 | 90,880 | 107,358 |
| Virginia..... | 959,119 | 2,101,716 | 1,098,038 | 676,663 | 535,616 | 547,706 |
| Washington..... | 1,429,032 | 3,862,916 | 4,961,220 | 7,546,239 | 7,325,862 | 7,305,277 |
| West Virginia..... | 778,051 | 1,472,942 | 763,103 | 588,788 | 641,870 | 647,823 |
| Wisconsin..... | 3,889,166 | 2,025,038 | 1,116,338 | 912,524 | 819,507 | 818,850 |
| Wyoming..... | 16,963 | 29,602 | 8,674 | 19,392 | 12,863 | 24,402 |
| All other..... | ⁴ 6,571 | ⁵ 711,230 | ..... | 14,002 | 16,982 | 13,908 |
| United States..... | ¹⁰ 35,084,166 | 44,509,761 | ¹¹ 34,552,076 | ¹⁰ 36,935,930 | ¹⁰ 34,532,420 | ¹⁰ 34,142,123 |

SUMMARY BY LUMBER-PRODUCING REGIONS

| REGIONS | | | | | | |
|-----------------------------|-----------------------|-----------------------|------------|----------------------|----------------------|----------------------|
| Northeastern..... | 5,709,224 | 5,197,012 | 2,583,873 | 1,409,098 | 1,231,308 | 1,210,250 |
| Lake..... | 8,749,842 | 5,476,270 | 2,691,868 | 2,046,958 | 1,794,652 | 1,803,252 |
| Central..... | 5,643,379 | 5,487,165 | 3,015,887 | 1,986,786 | 1,828,956 | 1,663,101 |
| North Carolina pine..... | 2,712,185 | 5,177,091 | 3,374,152 | 2,568,453 | 2,407,854 | 2,390,490 |
| Southern pine..... | 8,403,802 | 14,795,731 | 12,704,483 | 13,002,788 | 12,068,043 | 11,587,580 |
| Pacific (north)..... | 2,163,570 | 5,761,911 | 7,536,623 | 12,000,974 | 11,318,714 | 11,677,201 |
| Pacific (south)..... | 737,760 | 1,143,507 | 1,276,698 | 2,187,959 | 2,070,811 | 1,952,659 |
| Rocky Mountain (north)..... | 321,048 | 954,382 | 1,052,766 | 1,326,169 | 1,320,253 | 1,365,347 |
| Rocky Mountain (south)..... | 235,319 | 337,668 | 245,918 | 343,491 | 427,938 | 424,359 |
| Prairie..... | ¹² 408,036 | ¹² 179,024 | 64,808 | ¹² 63,283 | ¹² 63,891 | ¹² 67,875 |

Forest Service in cooperation with Bureau of the Census.

¹ Includes cut of Nevada.² Included in "All other."³ Included with California.⁴ Includes cut of North Dakota.⁵ Reported as cut of Alaska.⁷ Includes cut of Nebraska and Nevada.⁸ Includes both merchant and custom sawing.⁹ Includes 2,655 mills cutting less than 50,000 feet each per year.¹⁰ Mills cutting less than 50,000 feet each year excluded.¹¹ Excludes custom mills.¹² Includes "All other."

TABLE 589.—*Lumber prices: Average values per thousand feet, f. o. b. mill, Douglas fir and southern yellow pine*

| Year and month | Douglas fir | | Southern yellow pine | | Year and month | Douglas fir | | Southern yellow pine | |
|-------------------|----------------|----------------------------|-------------------------|----------------------------|-------------------|----------------|----------------------------|-------------------------|----------------------------|
| | Price | Price index 1913=100 | Price | Price index 191=3100 | | Price | Price index 1913=100 | Price | Price index 1913=100 |
| | <i>Dollars</i> | | <i>Dollars</i> | | 1929 | <i>Dollars</i> | | <i>Dollars</i> | |
| 1913..... | 11.44 | 100.0 | 14.77 | 100.0 | January..... | 20.12 | 175.9 | 26.20 | 177.4 |
| 1914..... | 10.58 | 92.5 | 13.68 | 92.6 | February..... | 20.30 | 177.4 | 25.56 | 173.1 |
| 1915..... | 9.80 | 85.5 | 13.02 | 88.2 | March..... | 21.24 | 185.7 | 26.40 | 178.7 |
| 1916..... | 11.63 | 101.7 | 16.12 | 109.2 | April..... | 21.21 | 185.4 | 27.74 | 187.8 |
| 1917..... | 16.93 | 147.9 | 21.13 | 143.1 | May..... | 21.81 | 190.6 | 26.18 | 177.3 |
| 1918..... | 21.21 | 186.3 | 26.45 | 179.1 | June..... | 21.35 | 186.6 | 26.46 | 179.1 |
| 1919..... | 25.83 | 225.9 | 33.94 | 229.8 | July..... | 21.29 | 186.1 | 25.47 | 172.4 |
| 1920..... | 36.78 | 323.3 | 44.74 | 302.9 | August..... | 21.32 | 186.4 | | |
| 1921..... | 19.98 | 174.7 | 21.18 | 143.4 | September..... | 21.41 | 187.2 | | |
| 1922..... | 23.90 | 208.9 | 26.44 | 179.0 | October..... | 21.00 | 183.6 | | |
| 1923..... | 28.93 | 252.9 | 30.81 | 208.6 | November..... | | | | |
| 1924..... | 23.14 | 202.3 | 28.16 | 190.7 | December..... | | | | |
| 1925..... | 21.63 | 189.1 | 28.31 | 191.7 | | | | | |
| 1926..... | 21.13 | 184.7 | 26.83 | 181.7 | | | | | |
| 1927..... | 20.42 | 178.5 | 25.62 | 173.5 | | | | | |
| 1928..... | 20.01 | 174.9 | 25.32 | 171.4 | | | | | |

Forest Service. Compiled from reports of actual sales.

¹ Based on prices for 11 months.

NOTE.—Tables 553, pulpwood consumption, and 554, woodland on farms, 1927 Yearbook, omitted.

TABLE 590.—Federal forest funds available for benefit of States

| State | Federal allotments to States Clark-McNary law, fiscal year ending June 30, 1930 | Amounts available to States fiscal year ending June 30, 1930 (from receipts fiscal year 1929) | | Total, all sources | |
|--|---|---|------------------------|--------------------|------------------------|
| | Forest fire cooperation, section 2 | Distribution of planting stock, section 4 | From 10 per cent funds | | From 25 per cent funds |
| | Dollars | Dollars | Dollars | Dollars | Dollars |
| Alabama..... | 42,000 | 2,000 | 76 | 189 | 44,355 |
| Arizona..... | | | 37,059 | 92,649 | 129,708 |
| Arkansas..... | | | 7,563 | 18,908 | 26,471 |
| California..... | 90,427 | 797 | 142,646 | 356,606 | 590,476 |
| Colorado..... | | 2,000 | 49,886 | 124,715 | 176,601 |
| Connecticut..... | 10,932 | 2,000 | | | 12,932 |
| Delaware..... | 919 | 2,000 | | | 2,919 |
| Florida..... | 37,017 | 1,357 | 3,156 | 7,890 | 49,420 |
| Georgia..... | 40,664 | 2,000 | 1,341 | 3,352 | 47,357 |
| Idaho..... | 62,390 | 900 | 62,771 | 156,928 | 282,089 |
| Illinois..... | 2,179 | | | | 2,179 |
| Indiana..... | 1,700 | 2,000 | | | 3,700 |
| Iowa..... | | 2,000 | | | 2,000 |
| Kansas..... | | 2,000 | | | 2,000 |
| Kentucky..... | 14,330 | 2,000 | | | 16,330 |
| Louisiana..... | 40,930 | 2,000 | | | 42,930 |
| Maine..... | 52,265 | 1,500 | 566 | 1,416 | 55,747 |
| Maryland..... | 9,929 | 2,000 | | | 11,929 |
| Massachusetts..... | 28,627 | 2,000 | | | 30,627 |
| Michigan..... | 79,380 | 2,000 | 674 | 1,685 | 83,739 |
| Minnesota..... | 83,798 | | 2,850 | 7,125 | 93,773 |
| Mississippi..... | 35,656 | | | | 35,656 |
| Missouri..... | 8,000 | 1,800 | | | 9,800 |
| Montana..... | 25,879 | 2,000 | 26,388 | 65,969 | 120,236 |
| Nebraska..... | | 2,000 | 954 | 2,396 | 5,354 |
| Nevada..... | | | 9,252 | 23,131 | 32,383 |
| New Hampshire..... | 16,852 | 2,000 | 7,813 | 19,532 | 46,197 |
| New Jersey..... | 19,712 | 2,000 | | | 21,712 |
| New Mexico..... | 2,181 | | 13,951 | 34,877 | 51,009 |
| New York..... | 63,511 | 2,000 | | | 65,511 |
| North Carolina..... | 14,757 | 2,000 | 3,062 | 7,655 | 27,474 |
| North Dakota..... | | 2,000 | | | 2,000 |
| Ohio..... | 5,315 | 2,000 | | | 7,315 |
| Oklahoma..... | 14,429 | 2,000 | 457 | 1,142 | 18,028 |
| Oregon..... | 83,575 | 2,000 | 106,007 | 265,026 | 456,608 |
| Pennsylvania..... | 49,351 | 2,000 | 405 | 1,012 | 52,768 |
| Rhode Island..... | 1,886 | | | | 1,886 |
| South Carolina..... | 20,250 | 2,000 | 507 | 1,267 | 24,024 |
| South Dakota..... | 375 | | 17,195 | 42,988 | 60,558 |
| Tennessee..... | 23,619 | 2,000 | 1,192 | 2,981 | 29,792 |
| Texas..... | 32,661 | | | | 32,661 |
| Utah..... | | | 20,515 | 51,287 | 71,802 |
| Vermont..... | 7,694 | 2,000 | | | 9,694 |
| Virginia..... | 32,814 | 2,000 | 3,695 | 9,238 | 47,747 |
| Washington..... | 90,369 | 1,980 | 67,112 | 167,779 | 327,260 |
| West Virginia..... | 22,733 | 1,500 | 698 | 1,745 | 26,676 |
| Wisconsin..... | 37,987 | 2,000 | | | 39,987 |
| Wyoming..... | | 1,948 | 29,784 | 74,400 | 106,192 |
| Total United States..... | 1,237,203 | 69,782 | 617,579 | 1,543,948 | 3,468,512 |
| Alaska..... | | | 8,252 | 20,629 | 28,881 |
| Hawaii..... | | 2,000 | | | 2,000 |
| Porto Rico..... | | 2,000 | 25 | 63 | 2,088 |
| Administration, contingent, and miscellaneous..... | 162,797 | 9,218 | | | 172,015 |
| Total..... | 1,400,000 | 83,000 | 625,856 | 1,564,640 | 3,673,496 |

Forest Service.

TABLE 591.—*Number of stock grazed on national forests, calendar year 1928, and total grazing receipts, fiscal year 1929, by States*

| | Cattle | Horses | Swine | Sheep and goats ¹ | Receipts from grazing ² |
|---------------------|---------------|---------------|---------------|------------------------------|------------------------------------|
| | <i>Number</i> | <i>Number</i> | <i>Number</i> | <i>Number</i> | <i>Dollars</i> |
| Alabama..... | 34 | 2 | | | 10 |
| Arizona..... | 191,058 | 11,118 | 475 | 297,442 | 149,107 |
| Arkansas..... | 2,023 | 5 | 1,700 | 210 | 176 |
| California..... | 150,636 | 8,357 | 557 | 444,177 | 190,904 |
| Colorado..... | 279,960 | 10,310 | 68 | 1,051,046 | 322,297 |
| Florida..... | 393 | | 768 | 1,359 | 227 |
| Idaho..... | 121,786 | 14,902 | | 1,338,996 | 225,077 |
| Montana..... | 121,589 | 13,002 | | 603,053 | 139,818 |
| Nebraska..... | 11,265 | 590 | | | 9,412 |
| Nevada..... | 51,381 | 3,424 | | 316,538 | 84,008 |
| New Hampshire..... | 129 | 35 | | | 216 |
| New Mexico..... | 84,535 | 9,369 | 308 | 240,776 | 91,881 |
| North Carolina..... | 421 | 43 | 689 | 246 | 266 |
| Oklahoma..... | 2,496 | 79 | | | 3,137 |
| Oregon..... | 85,084 | 5,638 | | 648,328 | 156,971 |
| Pennsylvania..... | 250 | | | | |
| South Dakota..... | 23,708 | 1,908 | | 20,180 | 18,186 |
| Tennessee..... | 1,024 | 38 | 164 | 262 | 162 |
| Utah..... | 112,083 | 8,010 | 175 | 758,990 | 174,607 |
| Virginia..... | 908 | 15 | | 467 | 510 |
| Washington..... | 11,296 | 1,100 | | 161,513 | 42,717 |
| West Virginia..... | 203 | 63 | 39 | 965 | 383 |
| Wyoming..... | 106,563 | 7,468 | | 656,383 | 130,033 |
| Total..... | 1,358,825 | 95,476 | 4,943 | 6,540,931 | ³ 1,740,290 |

SUMMARY BY ADMINISTRATIVE DISTRICTS

| District: | | | | | |
|-----------|---------|--------|-------|-----------|---------|
| 1..... | 127,320 | 14,092 | | 698,377 | 161,117 |
| 2..... | 380,910 | 18,095 | 68 | 1,477,011 | 428,401 |
| 3..... | 274,407 | 20,445 | 783 | 535,813 | 239,634 |
| 4..... | 323,787 | 27,548 | 175 | 2,572,203 | 509,576 |
| 5..... | 150,636 | 8,357 | 557 | 444,177 | 199,427 |
| 6..... | 96,380 | 6,738 | | 809,841 | 199,999 |
| 7..... | 5,385 | 201 | 3,360 | 3,509 | 2,136 |
| 8..... | | | | | |

Forest Service.

¹ Goats form less than three-tenths of 1 per cent of number.² Final, but not approved by General Accounting Office. Includes trespass.³ Includes receipts from Georgia, Maine, and South Carolina totaling \$185.

84722°—30—87+

TABLE 592.—*Free use timber: Cut from national forests, by States and districts, 1910, 1920, and 1928*

| State | Fiscal year 1910 | | Fiscal year 1920 | | Calendar year 1928 | |
|---------------------|--------------------|-----------------|--------------------|-----------------|--------------------|-----------------|
| | Total quantity | Estimated users | Total quantity | Estimated users | Total quantity | Estimated users |
| | <i>M ft. b. m.</i> | <i>Number</i> | <i>M ft. b. m.</i> | <i>Number</i> | <i>M ft. b. m.</i> | <i>Number</i> |
| Alabama..... | | | | 12 | | |
| Alaska..... | 184 | 6 | 4, 897 | 503 | 2, 006 | 508 |
| Arizona..... | 5, 264 | 1, 972 | 6, 418 | 4, 306 | 6, 642 | 4, 448 |
| Arkansas..... | 513 | 536 | 61 | 9 | 23 | 3 |
| California..... | 7, 647 | 3, 215 | 5, 238 | 1, 606 | 2, 805 | 2, 472 |
| Colorado..... | 12, 560 | 3, 598 | 9, 783 | 3, 920 | 9, 728 | 4, 241 |
| Florida..... | 95 | 32 | 330 | 96 | | |
| Georgia..... | | | 10 | 8 | | |
| Idaho..... | 19, 937 | 6, 472 | 14, 455 | 5, 530 | 16, 169 | 4, 700 |
| Michigan..... | | | 216 | 42 | 70 | 19 |
| Minnesota..... | 381 | 15 | 160 | 64 | 137 | 10 |
| Montana..... | 14, 713 | 5, 441 | 8, 151 | 4, 290 | 7, 852 | 3, 826 |
| Nebraska..... | | | 3 | 3 | | |
| Nevada..... | 1, 710 | 678 | 1, 777 | 528 | 1, 744 | 439 |
| New Mexico..... | 10, 004 | 3, 801 | 8, 859 | 6, 472 | 7, 643 | 6, 163 |
| North Carolina..... | | | 17 | 12 | 746 | 313 |
| North Dakota..... | 21 | 62 | | | | |
| Oklahoma..... | 123 | 192 | 180 | 600 | 55 | 60 |
| Oregon..... | 10, 068 | 2, 455 | 7, 515 | 1, 428 | 6, 949 | 1, 260 |
| Pennsylvania..... | | | | | 7 | 3 |
| South Dakota..... | 3, 476 | 1, 185 | 2, 963 | 910 | 1, 234 | 434 |
| Tennessee..... | | | 1, 027 | 385 | 985 | 435 |
| Utah..... | 8, 260 | 3, 426 | 8, 553 | 4, 985 | 9, 637 | 7, 108 |
| Virginia..... | | | 148 | 97 | 427 | 225 |
| Washington..... | 2, 444 | 503 | 1, 026 | 251 | 751 | 195 |
| West Virginia..... | | | 8 | 3 | 13 | 5 |
| Wyoming..... | 7, 416 | 1, 775 | 6, 264 | 1, 276 | 6, 819 | 1, 298 |
| Total..... | 104, 796 | 35, 364 | 88, 060 | 37, 336 | 82, 442 | 38, 165 |

SUMMARY BY ADMINISTRATIVE DISTRICTS

| District: | | | | | | |
|-----------|-----|-----|---------|---------|---------|---------|
| 1..... | (1) | (1) | 8, 865 | 4, 510 | 8, 209 | 3, 981 |
| 2..... | (1) | (1) | 16, 443 | 5, 658 | 13, 899 | 5, 304 |
| 3..... | (1) | (1) | 15, 273 | 10, 775 | 14, 233 | 10, 591 |
| 4..... | (1) | (1) | 27, 021 | 11, 383 | 31, 389 | 12, 867 |
| 5..... | (1) | (1) | 5, 238 | 1, 606 | 2, 805 | 2, 472 |
| 6..... | (1) | (1) | 13, 438 | 2, 182 | 7, 700 | 1, 451 |
| 7..... | (1) | (1) | 1, 782 | 1, 222 | 2, 201 | 984 |
| 8..... | (1) | (1) | (2) | (2) | 2, 006 | 508 |

Forest service.

¹ Not combined by districts previous to 1918.² Included in district 6.TABLE 593.—*County extension agents: Number employed, United States, 1928 and*

| Kind of extension agent | Number employed June 30, 1928 | Number employed June 30, 1929 |
|---------------------------------------|-------------------------------|-------------------------------|
| County agricultural agents..... | 2, 318 | 2, 452 |
| Negro agents (men)..... | 160 | 172 |
| Total..... | 2, 478 | 2, 624 |
| County home demonstration agents..... | 941 | 1, 167 |
| Negro agents (women)..... | 108 | 125 |
| Total..... | 1, 049 | 1, 292 |
| County club agents..... | 145 | 252 |
| Negro agents (club)..... | 3 | 2 |
| Total..... | 148 | 254 |
| Grand total, all agents..... | 3, 675 | 4, 170 |

Extension service.

TABLE 594.—*Adult result demonstrations and junior projects completed and improved practices adopted, 1926-1928, as reported by all county extension agents*

| Project | Adult result demonstrations | | | Junior projects completed ¹ | | | Better practices adopted | | |
|--|-----------------------------|---------|---------|--|---------|---------|--------------------------|-----------|-----------|
| | 1926 | 1927 | 1928 | 1926 | 1927 | 1928 | 1926 | 1927 | 1928 |
| Soils..... | 47,708 | 48,754 | 60,135 | ----- | ----- | ----- | 257,588 | 279,774 | 306,491 |
| Cereals..... | 38,687 | 41,712 | 40,339 | 24,107 | 25,789 | 26,997 | 261,621 | 300,092 | 250,913 |
| Legumes and forage..... | 64,516 | 72,539 | 71,483 | 4,988 | 5,253 | 6,137 | 225,287 | 241,956 | 226,171 |
| Potatoes, cotton, and other special crops..... | 34,178 | 35,132 | 40,655 | 30,458 | 25,228 | 36,475 | 179,639 | 166,909 | 205,228 |
| Horticulture..... | 80,304 | 98,841 | 105,957 | 81,494 | 88,922 | 112,206 | 294,007 | 344,836 | 354,516 |
| Forestry..... | 2,286 | 3,358 | 4,510 | 730 | 2,192 | 2,719 | 10,074 | 15,807 | 18,902 |
| Dairy..... | 17,797 | 22,571 | 29,815 | 19,094 | 23,076 | 29,468 | 418,345 | 429,105 | 461,888 |
| Animal husbandry..... | 16,375 | 19,793 | 18,605 | 37,409 | 44,341 | 48,233 | 171,533 | 198,516 | 223,554 |
| Poultry..... | 43,759 | 50,102 | 55,443 | 52,730 | 56,756 | 56,900 | 227,352 | 259,222 | 260,648 |
| Agricultural engineering..... | 19,001 | 21,749 | 24,152 | ----- | ----- | ----- | 120,200 | 151,478 | 140,460 |
| Rodents and insects..... | 17,490 | 22,208 | 19,591 | ----- | ----- | ----- | 265,255 | 259,321 | 220,956 |
| Agricultural economics..... | ----- | ----- | ----- | 6,139 | 4,925 | 8,361 | 492,176 | 492,495 | 526,700 |
| Foods..... | 90,827 | 98,719 | 128,497 | 131,121 | 142,302 | 167,058 | 325,455 | 397,517 | 404,517 |
| Nutrition..... | 37,335 | 43,931 | 47,027 | 39,071 | 54,451 | 62,790 | 168,029 | 168,293 | 211,991 |
| Clothing..... | 55,387 | 81,126 | 74,644 | 133,501 | 146,181 | 162,291 | 299,221 | 297,245 | 320,202 |
| Home management..... | 19,823 | 30,950 | 33,941 | 10,215 | 13,822 | 16,309 | 74,038 | 106,677 | 99,156 |
| House furnishings..... | 25,944 | 33,093 | 35,052 | 24,834 | 30,024 | 36,274 | 106,789 | 126,417 | 141,034 |
| Home health and sanitation..... | 17,657 | 23,421 | 25,387 | 40,857 | 56,352 | 59,342 | 128,580 | 164,804 | 179,687 |
| Miscellaneous..... | 15,681 | 24,186 | 35,293 | 37,249 | 56,415 | 51,145 | 79,305 | 108,673 | 109,083 |
| Total..... | 644,784 | 772,185 | 851,526 | 673,997 | 776,029 | 882,795 | 4,104,494 | 4,518,737 | 4,662,097 |

Extension service.

¹ Boys' and girls' club members completing.TABLE 595.—*4-H club work: Number of clubs, enrollment, etc., 1925-1928*

| Item | 1925 | 1926 | 1927 | 1928 |
|---------------------------------|-----------|-----------|-----------|-----------|
| Junior clubs..... | 41,286 | 41,234 | 44,188 | 46,671 |
| Different boys enrolled..... | 224,633 | 234,078 | 249,553 | 270,534 |
| Different girls enrolled..... | 340,413 | 352,078 | 370,159 | 393,406 |
| Total enrollment..... | 565,046 | 586,156 | 619,712 | 663,940 |
| Different boys completing..... | 133,076 | 145,202 | 153,324 | 175,069 |
| Different girls completing..... | 196,498 | 223,103 | 245,783 | 272,510 |
| Total completing..... | 329,574 | 368,305 | 399,107 | 447,579 |
| Projects started..... | 1,079,604 | 1,161,024 | 1,350,239 | 1,466,584 |
| Projects completed..... | 589,440 | 673,997 | 776,029 | 882,795 |

Extension service.

TABLE 596.—*Cooperative extension work: Projects and percentage of agents' and specialists' time devoted to each, 1924-1928*

| Project | 1924 | 1925 | 1926 | 1927 | 1928 |
|---------------------------------|------|------|------|------|------|
| Soils..... | 4.7 | 5.2 | 5.3 | 4.8 | 5.1 |
| Farm crops..... | 12.9 | 13.1 | 13.1 | 12.4 | 11.5 |
| Horticulture..... | 6.4 | 6.9 | 7.3 | 7.1 | 7.3 |
| Forestry..... | .4 | .5 | .7 | .9 | 1.0 |
| Animal husbandry..... | 8.6 | 7.1 | 7.5 | 8.2 | 7.8 |
| Dairy husbandry..... | 6.7 | 7.0 | 7.1 | 7.9 | 8.7 |
| Poultry husbandry..... | 8.6 | 8.7 | 9.0 | 8.8 | 8.1 |
| Rural engineering..... | 3.3 | 3.7 | 3.6 | 3.4 | 3.3 |
| Rodents and insects..... | 1.6 | 2.0 | 1.7 | 1.5 | 1.3 |
| Agricultural economics..... | 4.0 | 3.9 | 4.0 | 4.1 | 4.0 |
| Foods..... | 4.4 | 4.8 | 4.6 | 4.6 | 4.4 |
| Nutrition..... | 2.7 | 2.3 | 2.6 | 2.5 | 2.6 |
| Clothing..... | 7.4 | 7.9 | 7.1 | 6.8 | 6.8 |
| Home management..... | 1.4 | 1.7 | 1.5 | 1.5 | 1.7 |
| House furnishing..... | 1.1 | 1.2 | 1.8 | 2.0 | 2.4 |
| Home health and sanitation..... | 1.4 | 1.2 | 1.2 | 1.2 | 1.2 |
| Community activities..... | 8.1 | 6.2 | 5.9 | 6.0 | 5.8 |
| Miscellaneous..... | 16.3 | 16.6 | 16.0 | 16.3 | 17.0 |

Extension service.

¹ Only field work of specialists as reported by county extension agents is included.

TABLE 597.—Temperature: Normal¹ and 1929, by months, at selected points in the United States

| Station | January | | February | | March | | April | | May | | June | | July | | August | | September | | October | | November | | December | | Annual | | |
|----------------------|---------|------|----------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|-----------|------|---------|------|----------|------|----------|------|--------|------|------|
| | Normal | 1929 | Normal | 1929 | Normal | 1929 | Normal | 1929 | Normal | 1929 | Normal | 1929 | Normal | 1929 | Normal | 1929 | Normal | 1929 | Normal | 1929 | Normal | 1929 | Normal | 1929 | | | |
| Greenville, Me. | 12.5 | 11.4 | 13.1 | 15.8 | 24.6 | 27.0 | 37.0 | 36.2 | 49.3 | 51.3 | 55.8 | 60.4 | 65.2 | 63.9 | 61.8 | 61.2 | 55.0 | 56.3 | 45.0 | 43.1 | 31.1 | 31.0 | 17.9 | 15.6 | 39.3 | 39.4 | |
| Burlington, Vt. | 18.8 | 18.3 | 19.0 | 20.0 | 29.1 | 32.8 | 43.3 | 42.6 | 56.5 | 54.3 | 65.7 | 64.4 | 70.3 | 67.6 | 69.6 | 69.3 | 60.3 | 60.6 | 49.2 | 46.1 | 34.3 | 36.6 | 24.4 | 20.4 | 43.1 | 43.9 | |
| Boston, Mass. | 27.9 | 29.0 | 28.8 | 31.7 | 35.6 | 41.4 | 46.8 | 47.1 | 57.1 | 61.0 | 66.5 | 68.4 | 71.7 | 72.6 | 69.9 | 69.3 | 63.2 | 63.4 | 51.9 | 53.2 | 42.0 | 44.7 | 29.8 | 32.6 | 49.6 | 51.4 | |
| Buffalo, N. Y. | 24.6 | 23.7 | 24.3 | 22.4 | 31.1 | 38.1 | 41.4 | 42.8 | 48.8 | 54.6 | 62.8 | 64.4 | 68.4 | 69.8 | 68.9 | 69.3 | 63.2 | 63.1 | 51.9 | 53.2 | 42.0 | 44.7 | 29.8 | 32.6 | 49.6 | 51.4 | |
| Canton, N. Y. | 16.3 | 17.2 | 18.0 | 14.9 | 27.7 | 32.7 | 42.5 | 43.5 | 56.2 | 62.7 | 68.6 | 69.1 | 73.5 | 74.6 | 72.6 | 66.6 | 62.8 | 59.3 | 61.2 | 47.2 | 45.2 | 33.4 | 35.0 | 22.7 | 17.3 | 42.8 | |
| Trenton, N. J. | 30.5 | 31.7 | 30.7 | 33.0 | 39.1 | 46.0 | 49.8 | 52.2 | 61.2 | 63.1 | 69.5 | 69.1 | 74.5 | 74.6 | 72.6 | 66.6 | 62.8 | 59.3 | 61.2 | 47.2 | 45.2 | 33.4 | 35.0 | 22.7 | 17.3 | 42.8 | |
| Pittsburgh, Pa. | 30.7 | 28.0 | 32.2 | 28.6 | 39.6 | 46.4 | 51.2 | 53.4 | 62.4 | 62.4 | 69.5 | 70.7 | 76.8 | 77.1 | 75.1 | 72.6 | 66.6 | 62.8 | 59.3 | 61.2 | 47.2 | 45.2 | 33.4 | 35.0 | 22.7 | 17.3 | 42.8 |
| Saratoga, Pa. | 26.6 | 27.2 | 27.3 | 28.3 | 35.7 | 40.9 | 49.2 | 52.4 | 60.6 | 63.1 | 69.5 | 67.1 | 71.6 | 71.6 | 72.6 | 66.6 | 62.8 | 59.3 | 61.2 | 47.2 | 45.2 | 33.4 | 35.0 | 22.7 | 17.3 | 42.8 | |
| Cincinnati, Ohio | 30.3 | 29.5 | 32.2 | 27.8 | 37.8 | 40.9 | 49.2 | 52.4 | 60.6 | 63.1 | 69.5 | 67.1 | 71.6 | 71.6 | 72.6 | 66.6 | 62.8 | 59.3 | 61.2 | 47.2 | 45.2 | 33.4 | 35.0 | 22.7 | 17.3 | 42.8 | |
| Cleveland, Ohio | 26.5 | 25.0 | 27.4 | 25.2 | 34.6 | 43.6 | 46.4 | 50.6 | 57.9 | 63.8 | 75.1 | 73.0 | 78.9 | 79.4 | 77.4 | 73.5 | 68.9 | 63.8 | 53.2 | 52.2 | 40.9 | 39.4 | 31.2 | 32.9 | 49.2 | 49.7 | |
| Evansville, Ind. | 33.3 | 31.0 | 36.3 | 29.8 | 45.0 | 51.4 | 56.7 | 59.5 | 66.9 | 73.8 | 75.1 | 73.0 | 78.9 | 79.4 | 77.4 | 73.5 | 68.9 | 63.8 | 53.2 | 52.2 | 40.9 | 39.4 | 31.2 | 32.9 | 49.2 | 49.7 | |
| Indianapolis, Ind. | 28.4 | 24.0 | 31.1 | 25.6 | 40.0 | 47.2 | 52.1 | 55.0 | 62.9 | 69.4 | 71.0 | 68.6 | 73.5 | 73.5 | 71.6 | 67.0 | 63.0 | 53.2 | 52.2 | 40.9 | 39.4 | 31.2 | 32.9 | 49.2 | 49.7 | 49.7 | |
| Fort Wayne, Ind. | 23.7 | 17.8 | 25.9 | 21.2 | 37.0 | 45.4 | 48.9 | 51.1 | 57.3 | 65.8 | 67.3 | 64.4 | 71.6 | 71.6 | 67.0 | 63.0 | 53.2 | 52.2 | 40.9 | 39.4 | 31.2 | 32.9 | 49.2 | 49.7 | 49.7 | 49.7 | |
| Chicago, Ill. | 34.9 | 33.4 | 38.5 | 31.4 | 47.2 | 52.0 | 58.1 | 61.5 | 68.4 | 75.4 | 76.3 | 74.4 | 79.6 | 79.6 | 77.8 | 73.9 | 69.2 | 64.6 | 53.2 | 52.2 | 40.9 | 39.4 | 31.2 | 32.9 | 49.2 | 49.7 | |
| Peoria, Ill. | 23.1 | 18.6 | 23.7 | 20.6 | 33.4 | 39.6 | 47.0 | 48.6 | 54.8 | 63.5 | 67.3 | 64.4 | 71.6 | 71.6 | 67.0 | 63.0 | 53.2 | 52.2 | 40.9 | 39.4 | 31.2 | 32.9 | 49.2 | 49.7 | 49.7 | 49.7 | |
| Carro, Ill. | 34.9 | 33.4 | 38.5 | 31.4 | 47.2 | 52.0 | 58.1 | 61.5 | 68.4 | 75.4 | 76.3 | 74.4 | 79.6 | 79.6 | 77.8 | 73.9 | 69.2 | 64.6 | 53.2 | 52.2 | 40.9 | 39.4 | 31.2 | 32.9 | 49.2 | 49.7 | |
| Grand Rapids, Mich. | 21.5 | 13.8 | 23.7 | 21.6 | 33.4 | 39.6 | 47.0 | 48.6 | 54.8 | 63.5 | 67.3 | 64.4 | 71.6 | 71.6 | 67.0 | 63.0 | 53.2 | 52.2 | 40.9 | 39.4 | 31.2 | 32.9 | 49.2 | 49.7 | 49.7 | 49.7 | |
| Alpena, Mich. | 19.1 | 13.8 | 23.7 | 21.6 | 33.4 | 39.6 | 47.0 | 48.6 | 54.8 | 63.5 | 67.3 | 64.4 | 71.6 | 71.6 | 67.0 | 63.0 | 53.2 | 52.2 | 40.9 | 39.4 | 31.2 | 32.9 | 49.2 | 49.7 | 49.7 | 49.7 | |
| Marquette, Mich. | 16.3 | 10.2 | 16.3 | 12.5 | 24.8 | 30.1 | 35.6 | 40.7 | 50.5 | 57.4 | 60.4 | 58.6 | 64.4 | 64.4 | 62.6 | 58.7 | 54.9 | 46.8 | 41.1 | 30.4 | 30.4 | 26.3 | 28.9 | 28.9 | 28.9 | 48.5 | |
| Madison, Wis. | 16.7 | 6.4 | 19.1 | 12.8 | 24.8 | 30.1 | 35.6 | 40.7 | 50.5 | 57.4 | 60.4 | 58.6 | 64.4 | 64.4 | 62.6 | 58.7 | 54.9 | 46.8 | 41.1 | 30.4 | 30.4 | 26.3 | 28.9 | 28.9 | 28.9 | 48.5 | |
| Green Bay, Wis. | 17.7 | 3.8 | 17.4 | 10.8 | 28.6 | 33.4 | 43.2 | 45.0 | 54.0 | 61.5 | 64.0 | 61.5 | 67.0 | 67.0 | 65.2 | 61.3 | 57.3 | 48.8 | 41.1 | 30.4 | 30.4 | 26.3 | 28.9 | 28.9 | 28.9 | 48.5 | |
| Duluth, Minn. | 7.9 | -2.6 | 11.4 | 6.8 | 23.1 | 28.3 | 37.0 | 38.8 | 47.0 | 54.5 | 57.2 | 54.5 | 60.0 | 60.0 | 58.2 | 54.3 | 50.3 | 41.8 | 34.1 | 26.6 | 26.6 | 22.5 | 22.5 | 22.5 | 22.5 | 42.1 | |
| St. Paul, Minn. | 12.6 | 9.1 | 13.8 | 9.6 | 20.1 | 25.3 | 34.0 | 35.8 | 44.0 | 51.5 | 54.2 | 51.5 | 57.0 | 57.0 | 55.2 | 51.3 | 47.3 | 38.8 | 31.1 | 23.6 | 23.6 | 19.5 | 19.5 | 19.5 | 19.5 | 42.1 | |
| Des Moines, Iowa | 20.1 | 11.6 | 22.7 | 15.0 | 31.0 | 36.8 | 45.0 | 47.0 | 56.0 | 63.5 | 66.0 | 63.5 | 69.0 | 69.0 | 67.2 | 63.3 | 59.3 | 50.8 | 43.1 | 35.6 | 35.6 | 31.5 | 31.5 | 31.5 | 31.5 | 42.1 | |
| Dubuque, Iowa | 19.1 | 9.6 | 22.2 | 14.0 | 34.0 | 38.6 | 48.6 | 51.0 | 60.3 | 66.3 | 68.5 | 69.4 | 73.0 | 73.0 | 71.2 | 67.3 | 63.3 | 54.8 | 47.1 | 39.6 | 39.6 | 35.5 | 35.5 | 35.5 | 35.5 | 48.0 | |
| St. Louis, Mo. | 21.1 | 27.6 | 24.8 | 21.9 | 34.1 | 40.8 | 48.8 | 50.8 | 60.0 | 67.5 | 70.0 | 67.5 | 73.0 | 73.0 | 71.2 | 67.3 | 63.3 | 54.8 | 47.1 | 39.6 | 39.6 | 35.5 | 35.5 | 35.5 | 35.5 | 48.0 | |
| St. Joseph, Mo. | 27.5 | 28.6 | 28.8 | 25.8 | 41.4 | 48.1 | 56.8 | 58.8 | 68.0 | 75.5 | 78.0 | 75.5 | 81.0 | 81.0 | 79.2 | 75.3 | 71.3 | 62.8 | 55.1 | 47.6 | 39.6 | 39.6 | 35.5 | 35.5 | 35.5 | 35.5 | 48.0 |
| Springfield, Mo. | 33.5 | 29.6 | 33.2 | 29.6 | 45.4 | 52.1 | 60.8 | 62.8 | 72.0 | 79.5 | 82.0 | 79.5 | 85.0 | 85.0 | 83.2 | 79.3 | 75.3 | 66.8 | 59.1 | 51.6 | 43.6 | 43.6 | 39.5 | 39.5 | 39.5 | 39.5 | 48.0 |
| Bismarck, N. Dak. | 7.8 | -2.9 | 10.3 | 4.6 | 24.2 | 32.2 | 42.1 | 43.2 | 54.3 | 61.8 | 64.3 | 61.8 | 67.3 | 67.3 | 65.5 | 61.6 | 57.6 | 49.1 | 41.6 | 34.1 | 34.1 | 30.0 | 30.0 | 30.0 | 30.0 | 42.1 | |
| Devils Lake, N. Dak. | 1.8 | -7.1 | 6.1 | 1.4 | 19.8 | 28.6 | 38.8 | 39.8 | 52.6 | 60.1 | 62.6 | 60.1 | 65.6 | 65.6 | 63.8 | 59.9 | 56.0 | 47.5 | 39.0 | 31.5 | 31.5 | 27.4 | 27.4 | 27.4 | 27.4 | 42.1 | |
| Pierre, S. Dak. | 16.0 | 5.5 | 18.6 | 12.0 | 27.1 | 33.1 | 42.8 | 44.8 | 55.9 | 63.4 | 65.9 | 63.4 | 68.9 | 68.9 | 67.1 | 63.2 | 59.2 | 50.7 | 43.2 | 35.7 | 35.7 | 31.6 | 31.6 | 31.6 | 31.6 | 42.1 | |
| North Platte, Nebr. | 22.9 | 19.0 | 26.0 | 18.7 | 36.0 | 40.7 | 48.8 | 50.8 | 60.0 | 67.5 | 70.0 | 67.5 | 73.0 | 73.0 | 71.2 | 67.3 | 63.3 | 54.8 | 47.1 | 39.6 | 39.6 | 35.5 | 35.5 | 35.5 | 35.5 | 48.0 | |
| Omaha, Nebr. | 21.9 | 13.6 | 25.5 | 18.6 | 31.7 | 42.4 | 51.1 | 53.1 | 62.2 | 69.7 | 72.2 | 69.7 | 75.2 | 75.2 | 73.4 | 69.5 | 65.5 | 57.0 | 49.5 | 42.0 | 34.5 | 34.5 | 30.4 | 30.4 | 30.4 | 30.4 | 42.1 |
| Concordia, Kans. | 26.4 | 20.6 | 29.6 | 22.0 | 41.8 | 46.1 | 54.9 | 56.9 | 66.0 | 73.5 | 76.0 | 73.5 | 79.0 | 79.0 | 77.2 | 73.3 | 69.3 | 60.8 | 53.3 | 45.8 | 38.3 | 38.3 | 34.2 | 34.2 | 34.2 | 34.2 | 42.1 |
| Dodge City, Kans. | 23.0 | 20.6 | 33.2 | 24.4 | 42.8 | 46.1 | 54.9 | 56.9 | 66.0 | 73.5 | 76.0 | 73.5 | 79.0 | 79.0 | 77.2 | 73.3 | 69.3 | 60.8 | 53.3 | 45.8 | 38.3 | 38.3 | 34.2 | 34.2 | 34.2 | 34.2 | 42.1 |
| Idola, Kans. | 29.8 | 26.3 | 33.2 | 26.8 | 45.4 | 49.7 | 58.5 | 60.5 | 69.6 | 77.1 | 79.6 | 77.1 | 82.6 | 82.6 | 80.8 | 76.9 | 72.9 | 64.4 | 56.9 | 49.4 | 41.9 | 41.9 | 37.8 | 37.8 | 37.8 | 37.8 | 42.1 |
| Kansas, Kans. | 26.0 | 20.6 | 33.2 | 24.4 | 42.8 | 46.1 | 54.9 | 56.9 | 66.0 | 73.5 | 76.0 | 73.5 | 79.0 | 79.0 | 77.2 | 73.3 | 69.3 | 60.8 | 53.3 | 45.8 | 38.3 | 38.3 | 34.2 | 34.2 | 34.2 | 34.2 | 42.1 |
| Washington, D. C. | 33.4 | 34.9 | 35.3 | 35.0 | 42.6 | 50.2 | 57.8 | 59.8 | 67.3 | 74.8 | 77.3 | 74.8 | 79.8 | 79.8 | 78.0 | 74.1 | 70.2 | 61.7 | 54.2 | 46.7 | 39.2 | 39.2 | 35.1 | 35.1 | 35.1 | 35.1 | 42.1 |
| Lynchburg, Va. | 37.5 | 37.2 | 40.3 | 38.2 | 47.3 | 52.4 | 57.5 | 59.5 | 67.0 | 74.5 | 77.0 | 74.5 | 79.5 | 79.5 | 77.7 | 73.8 | 69.9 | 61.4 | 53.9 | 46.4 | 38.9 | 38.9 | 34.8 | 34.8 | 34.8 | 34.8 | 42.1 |
| Norfolk, Va. | 40.6 | 42.2 | 42.7 | 41.3 | 48.2 | 54.7 | 59.8 | 61.8 | 69.3 | 76.8 | 79.3 | 76.8 | 81.8 | 81.8 | 79.9 | 76.0 | 72.1 | 63.6 | 56.1 | 48.6 | 41.1 | 41.1 | 37.0 | 37.0 | 37.0 | 37.0 | 42.1 |
| Portsmouth, N. H. | 32.5 | 31.2 | 34.2 | 30.2 | 43.8 | 48.4 | 53.4 | 57.4 | 64.9 | 72.4 | 74.9 | 72.4 | 77.4 | 77.4 | 75.6 | 71.7 | 67.8 | 59.3 | 51.8 | 44.3 | 36.8 | 36.8 | 32.7 | 32.7 | 32.7 | 32.7 | 42.1 |
| Petersburg, W. Va. | 32.5 | 31.2 | 34.2 | 30.2 | 43.8 | 48.4 | 53.4 | 57.4 | 64.9 | 72.4 | 74.9 | 72.4 | 77.4 | 77.4 | 75.6 | 71.7 | 67.8 | 59.3 | 51.8 | 44.3 | 36.8 | 36.8 | 32.7 | 32.7 | 32.7 | 32.7 | 42.1 |
| Lexington, Ky. | 32.9 | 32.0 | 35.4 | 26.2 | 43.7 | 48.4 | 53.4 | 57.4 | 64.9 | 72.4 | 74.9 | 72.4 | 77.4 | 77.4 | 75.6 | 71.7 | 67.8 | 59.3 | 51.8 | 44.3 | 36.8 | 36.8 | 32.7 | 32.7 | 32.7 | 32.7 | 42.1 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Charlotte, N. C. | 41.2 | 43.2 | 43.9 | 42.5 | 50.4 | 55.8 | 59.8 | 63.6 | 68.9 | 75.5 | 75.5 | 75.0 | 78.4 | 77.6 | 77.1 | 76.7 | 71.5 | 71.2 | 61.7 | 99.0 | 50.6 | 51.7 | 43.9 | 46.6 | 60.2 | 61.0 | |
| Wilmington, N. C. | 46.5 | 49.8 | 47.9 | 47.3 | 53.3 | 58.9 | 62.4 | 65.4 | 68.4 | 77.5 | 75.6 | 75.0 | 78.1 | 77.5 | 77.0 | 76.6 | 73.1 | 73.6 | 63.3 | 64.1 | 56.0 | 57.0 | 49.1 | 50.7 | 66.0 | 66.8 | |
| Charleston, S. C. | 49.9 | 53.0 | 52.4 | 51.1 | 57.4 | 61.4 | 64.1 | 65.8 | 67.2 | 75.1 | 73.3 | 73.0 | 76.9 | 76.6 | 76.1 | 75.6 | 72.6 | 73.0 | 62.8 | 63.4 | 58.1 | 60.0 | 44.1 | 50.7 | 66.0 | 66.8 | |
| Greenville, S. C. | 40.3 | 43.2 | 43.5 | 42.8 | 49.9 | 55.1 | 58.6 | 63.2 | 67.2 | 76.4 | 74.3 | 73.9 | 76.9 | 77.2 | 76.8 | 76.2 | 72.4 | 71.3 | 63.0 | 63.9 | 52.1 | 51.8 | 42.2 | 44.1 | 61.2 | 60.4 | |
| Atlanta, Ga. | 42.6 | 45.2 | 45.3 | 43.6 | 52.0 | 56.8 | 61.0 | 64.6 | 68.9 | 76.8 | 75.0 | 74.6 | 78.1 | 77.8 | 77.3 | 76.8 | 72.6 | 71.3 | 63.0 | 63.9 | 52.1 | 51.8 | 42.2 | 44.1 | 61.2 | 60.4 | |
| Thomasville, Ga. | 51.0 | 55.8 | 55.0 | 55.2 | 62.6 | 64.5 | 66.7 | 71.1 | 75.0 | 74.0 | 73.9 | 73.7 | 82.1 | 81.0 | 80.1 | 81.0 | 78.3 | 77.6 | 68.2 | 67.4 | 58.5 | 60.0 | 52.5 | 51.5 | 67.1 | 67.8 | |
| Jacksonville, Fla. | 66.5 | 70.4 | 67.1 | 71.6 | 70.2 | 72.9 | 72.8 | 73.5 | 76.4 | 78.7 | 78.0 | 77.9 | 82.1 | 81.0 | 80.1 | 81.0 | 78.3 | 77.6 | 68.2 | 67.4 | 58.5 | 60.0 | 52.5 | 51.5 | 67.1 | 67.8 | |
| Miami, Fla. | 66.5 | 70.4 | 67.1 | 71.6 | 70.2 | 72.9 | 72.8 | 73.5 | 76.4 | 78.7 | 78.0 | 77.9 | 82.1 | 81.0 | 80.1 | 81.0 | 78.3 | 77.6 | 68.2 | 67.4 | 58.5 | 60.0 | 52.5 | 51.5 | 67.1 | 67.8 | |
| Memphis, Tenn. | 40.9 | 44.0 | 44.3 | 37.0 | 52.3 | 56.2 | 61.8 | 65.4 | 69.2 | 76.6 | 75.6 | 75.0 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Nashville, Tenn. | 38.6 | 39.2 | 41.6 | 35.4 | 48.2 | 54.4 | 59.0 | 63.8 | 68.4 | 76.6 | 75.6 | 75.0 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Birmingham, Ala. | 45.1 | 47.8 | 48.0 | 44.2 | 55.4 | 59.4 | 63.8 | 68.4 | 73.1 | 77.0 | 77.9 | 77.6 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Mobile, Ala. | 51.5 | 53.6 | 54.7 | 51.9 | 59.7 | 63.6 | 66.3 | 71.1 | 74.4 | 74.8 | 74.0 | 73.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Meridian, Miss. | 47.0 | 49.8 | 49.6 | 43.8 | 57.1 | 60.8 | 64.0 | 67.6 | 71.3 | 72.6 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Vicksburg, Miss. | 48.2 | 49.7 | 51.8 | 44.5 | 58.5 | 62.2 | 65.6 | 68.8 | 73.3 | 72.9 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| New Orleans, La. | 54.2 | 56.6 | 57.3 | 53.8 | 62.8 | 66.2 | 69.6 | 73.3 | 77.4 | 72.5 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Shreveport, La. | 41.0 | 43.9 | 42.6 | 38.3 | 51.6 | 55.6 | 60.2 | 63.8 | 67.4 | 72.5 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Amarillo, Tex. | 33.3 | 36.4 | 38.1 | 30.6 | 43.9 | 48.2 | 52.4 | 56.6 | 60.8 | 67.8 | 72.5 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 |
| Brownsville, Tex. | 39.8 | 42.4 | 42.0 | 38.6 | 51.6 | 55.6 | 60.2 | 63.8 | 67.4 | 72.5 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| El Paso, Tex. | 43.0 | 46.1 | 46.0 | 42.6 | 55.6 | 59.6 | 63.8 | 67.4 | 72.5 | 72.5 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Fort Worth, Tex. | 43.8 | 46.1 | 46.0 | 42.6 | 55.6 | 59.6 | 63.8 | 67.4 | 72.5 | 72.5 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Galveston, Tex. | 43.8 | 46.1 | 46.0 | 42.6 | 55.6 | 59.6 | 63.8 | 67.4 | 72.5 | 72.5 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| San Antonio, Tex. | 43.8 | 46.1 | 46.0 | 42.6 | 55.6 | 59.6 | 63.8 | 67.4 | 72.5 | 72.5 | 72.0 | 71.9 | 80.1 | 79.2 | 78.3 | 79.2 | 76.6 | 75.6 | 65.4 | 64.5 | 53.9 | 55.8 | 47.7 | 49.7 | 64.0 | 64.5 | |
| Indianapolis, Ind. | 52.3 | 55.0 | 55.4 | 50.0 | 62.8 | 66.8 | 70.8 | 74.8 | 78.8 | 77.3 | 77.0 | 76.9 | 82.1 | 81.0 | 80.1 | 81.0 | 78.3 | 77.6 | 68.2 | 67.4 | 58.5 | 60.0 | 52.5 | 51.5 | 67.1 | 67.8 | |
| Kansas City, Mo. | 36.4 | 34.2 | 39.6 | 30.8 | 50.0 | 53.1 | 59.8 | 62.1 | 64.7 | 70.3 | 64.7 | 64.7 | 70.3 | 64.7 | 64.7 | 70.3 | 64.7 | 64.7 | 70.3 | 64.7 | 64.7 | 64.7 | 64.7 | 64.7 | 64.7 | 64.7 | |
| Little Rock, Ark. | 41.4 | 38.8 | 44.9 | 36.6 | 53.0 | 56.8 | 62.1 | 64.7 | 70.3 | 64.7 | 64.7 | 64.7 | 70.3 | 64.7 | 64.7 | 70.3 | 64.7 | 64.7 | 70.3 | 64.7 | 64.7 | 64.7 | 64.7 | 64.7 | 64.7 | 64.7 | |
| St. Louis, Mo. | 12.9 | 2.2 | 13.6 | 8.2 | 27.1 | 36.4 | 43.7 | 44.7 | 56.7 | 53.3 | 66.0 | 64.4 | 72.9 | 76.0 | 71.5 | 75.8 | 61.2 | 55.4 | 46.5 | 45.4 | 32.4 | 31.0 | 24.9 | 28.4 | 42.5 | 41.6 | |
| Wichita, Kan. | 14.5 | 3.0 | 16.8 | 8.8 | 28.6 | 37.9 | 44.7 | 44.7 | 56.7 | 53.3 | 66.0 | 64.4 | 72.9 | 76.0 | 71.5 | 75.8 | 61.2 | 55.4 | 46.5 | 45.4 | 32.4 | 31.0 | 24.9 | 28.4 | 42.5 | 41.6 | |
| Billings, Mont. | 20.4 | 10.2 | 23.3 | 14.6 | 32.9 | 35.8 | 43.6 | 40.4 | 51.4 | 50.9 | 57.7 | 57.4 | 64.1 | 66.2 | 62.8 | 67.9 | 63.5 | 51.6 | 43.5 | 45.4 | 32.4 | 31.0 | 24.9 | 28.4 | 42.5 | 41.6 | |
| Calgary, Alta. | 25.5 | 22.1 | 27.3 | 17.2 | 33.1 | 32.6 | 40.9 | 39.6 | 50.3 | 48.0 | 60.4 | 60.4 | 66.7 | 68.5 | 65.6 | 68.4 | 57.0 | 53.0 | 44.8 | 46.6 | 32.4 | 31.0 | 24.9 | 28.4 | 42.5 | 41.6 | |
| Cherbourg, Wyo. | 10.3 | 8.2 | 21.3 | 13.2 | 30.8 | 34.6 | 43.2 | 41.2 | 51.8 | 50.4 | 61.2 | 60.0 | 74.2 | 76.8 | 72.7 | 74.4 | 64.6 | 63.8 | 52.0 | 52.8 | 39.2 | 32.8 | 22.8 | 20.9 | 43.1 | 41.4 | |
| Pueblo, Colo. | 20.9 | 20.6 | 32.9 | 23.2 | 43.6 | 41.6 | 42.6 | 50.1 | 51.0 | 59.2 | 59.0 | 69.0 | 71.0 | 71.8 | 72.7 | 74.4 | 64.6 | 63.8 | 52.0 | 52.8 | 39.2 | 32.8 | 22.8 | 20.9 | 43.1 | 41.4 | |
| Grand Junction, Colo. | 24.8 | 19.5 | 32.9 | 23.2 | 43.6 | 41.6 | 42.6 | 50.1 | 51.0 | 59.2 | 59.0 | 69.0 | 71.0 | 71.8 | 72.7 | 74.4 | 64.6 | 63.8 | 52.0 | 52.8 | 39.2 | 32.8 | 22.8 | 20.9 | 43.1 | 41.4 | |
| Santa Fe, N. Mex. | 28.0 | 28.9 | 33.1 | 27.2 | 39.7 | 37.4 | 41.3 | 46.8 | 60.0 | 60.6 | 65.2 | 76.3 | 76.2 | 78.0 | 77.7 | 76.6 | 64.7 | 63.8 | 52.0 | 52.8 | 39.2 | 32.8 | 22.8 | 20.9 | 43.1 | 41.4 | |
| Roswell, N. Mex. | 29.1 | 30.7 | 37.2 | 42.6 | 37.4 | 41.3 | 46.8 | 60.0 | 60.6 | 65.2 | 76.3 | 76.2 | 78.0 | 77.7 | 76.6 | 64.7 | 63.8 | 52.0 | 52.8 | 39.2 | 32.8 | 22.8 | 20.9 | 43.1 | 41.4 | 51.2 | |
| Phoenix, Ariz. | 51.2 | 50.1 | 55.1 | 53.0 | 60.7 | 60.0 | 67.0 | 66.2 | 75.0 | 78.0 | 84.5 | 86.4 | 89.8 | 92.0 | 92.0 | 92.0 | 92.0 | 92.0 | 92.0 | 92.0 | 92.0 | 92.0 | 92.0 | 92.0 | 92.0 | 92.0 | |
| Modena, Utah | 29.2 | 26.7 | 31.0 | 27.3 | 38.2 | 38.5 | 46.0 | 46.2 | 53.5 | 55.2 | 63.3 | 62.9 | 70.6 | 72.4 | 69.2 | 74.0 | 60.0 | 60.0 | 46.0 | 46.0 | 36.4 | 35.5 | 27.9 | 57.9 | 69.7 | 47.6 | |
| Salt Lake City, Utah | 29.2 | 26.7 | 31.0 | 27.3 | 38.2 | 38.5 | 46.0 | 46.2 | 53.5 | 55.2 | 63.3 | 62.9 | 70.6 | 72.4 | 69.2 | 74.0 | 60.0 | 60.0 | 46.0 | 46.0 | 36.4 | 35.5 | 27.9 | 57.9 | 69.7 | 47.6 | |
| Winnemucca, Nev. | 28.6 | 27.4 | 33.5 | 29.2 | 42.0 | 42.0 | 46.7 | 46.7 | 53.9 | 53.9 | 62.8 | 61.6 | 70.9 | 73.2 | 69.3 | 73.2 | 69.3 | 69.3 | 57.0 | 57.0 | 38.4 | 38.4 | 30.0 | 39.0 | 48.4 | 48.7 | |
| Boise, Idaho | 28.6 | 27.4 | 33.5 | 29.2 | 42.0 | 42.0 | 46.7 | 46.7 | 53.9 | 53.9 | 62.8 | 61.6 | 70.9 | 73.2 | 69.3 | 73.2 | 69.3 | 69.3 | 57.0 | 57.0 | 38.4 | 38.4 | 30.0 | 39.0 | 48.4 | 48.7 | |
| Seattle, Wash. | 39.5 | 34.6 | 41.1 | 36.2 | 44.9 | 45.0 | 49.4 | 46.7 | 54.5 | 54.5 | 64.0 | 64.0 | 74.0 | 74.0 | 72.7 | 77.6 | 63.1 | 64.8 | 58.1 | 60.8 | 45.2 | 45.2 | 41.7 | 43.6 | 51.0 | 50.9 | |
| Wallula, Wash. | 32.7 | 21.8 | 37.1 | 24.7 | 46.1 | 47.1 | 51.8 | 49.2 | 56.9 | 56.9 | 66.2 | 62.4 | 66.7 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | |
| Portland, Ore. | 39.4 | 34.2 | 42.1 | 35.6 | 46.9 | 47.1 | 51.8 | 49.2 | 56.9 | 56.9 | 66.2 | 62.4 | 66.7 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | 68.3 | |
| Roseburg, Ore. | 41.1 | 36.4 | 43.4 | 39.4 | 47.1 | 46.8 | 51.0 | 47.5 | 56.6 | 56.6 | 62.5 | 61.0 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | 67.4 | |
| Eureka, Calif. | 46.9 | 45.0 | 47.2 | 44.8 | 48.3 | 48.3 | 49.9 | 48.2 | 52.0 | 51.6 | 54.3 | 55.6 | 58.2 | 57.1 | 56.0 | 57.0 | 55.9 | 55.6 | 53.6 | 53.6 | 51.1 | 47.5 | 45.2 | 46.0 | 63.0 | 63.4 | |
| Fresno, Calif. | 46.9 | 45.0 | 47.2 | 44.8 | 48.3 | 48.3 | 49.9 | 48.2 | 52.0 | 51.6 | 54.3 | 55.6 | 58.2 | 57.1 | 56.0 | 57.0 | 55.9 | 55.6 | 53.6 | 53.6 | 51.1 | 47.5 | 45.2 | 46.0 | 63.0 | 63.4 | |
| Los Angeles, Calif. | 54.6 | 55.2 | 55.5 | 54.4 | 57.5 | 57.5 | 58.4 | 57.5 | 58.4 | 57.5 | 58.4 | 57.5 | 58.4 | 57.5 | 58.4 | 57.5 | 58.4 | 57.5 | 58.4 | 57.5 | 58.4 | 57.5 | 58.4 | 57.5 | 58.4 | 57.5 | |
| Sacramento, Calif. | 45.8 | 41.2 | 40.1 | 49.0 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | 54.1 | |
| San Diego, Calif. | 54.3 | 54.4 | 55.2 | 53.2 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | 56.7 | |
| San Francisco, Calif. | 49.9 | 47.4 | 46.2 | 51.8 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | 54.2 | |

Weather Bureau.

TABLE 598.—Precipitation: Normal¹ and 1929, by months, at selected points in the United States

| Station | January | | February | | March | | April | | May | | June | | July | | August | | September | | October | | November | | December | | Annual | | | | | | |
|----------------------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------|-------|-------|------|----|
| | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | Nor- mal | 1929 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Greenville, Me. | Ins. | 2.83 | Ins. | 2.20 | Ins. | 3.15 | Ins. | 2.93 | Ins. | 3.30 | Ins. | 4.09 | Ins. | 3.24 | Ins. | 3.52 | Ins. | 4.08 | Ins. | 3.65 | Ins. | 3.46 | Ins. | 3.17 | Ins. | 3.41 | 42.24 | 37.04 | | | |
| Burlington, Vt. | Ins. | 2.83 | Ins. | 2.20 | Ins. | 3.15 | Ins. | 2.93 | Ins. | 3.30 | Ins. | 4.09 | Ins. | 3.24 | Ins. | 3.52 | Ins. | 4.08 | Ins. | 3.65 | Ins. | 3.46 | Ins. | 3.17 | Ins. | 3.41 | 42.24 | 37.04 | | | |
| Boston, Mass. | Ins. | 1.76 | Ins. | 1.38 | Ins. | 2.20 | Ins. | 2.93 | Ins. | 2.85 | Ins. | 4.09 | Ins. | 3.24 | Ins. | 3.52 | Ins. | 4.08 | Ins. | 3.65 | Ins. | 3.46 | Ins. | 3.17 | Ins. | 3.41 | 42.24 | 37.04 | | | |
| Buffalo, N. Y. | Ins. | 3.61 | Ins. | 3.82 | Ins. | 2.90 | Ins. | 3.56 | Ins. | 3.18 | Ins. | 3.89 | Ins. | 3.55 | Ins. | 3.49 | Ins. | 3.35 | Ins. | 3.37 | Ins. | 3.33 | Ins. | 2.01 | Ins. | 3.48 | 43.40 | 14.37 | 19 | | |
| Canton, N. Y. | Ins. | 3.30 | Ins. | 3.73 | Ins. | 2.95 | Ins. | 3.67 | Ins. | 3.10 | Ins. | 2.79 | Ins. | 2.89 | Ins. | 2.60 | Ins. | 3.02 | Ins. | 3.25 | Ins. | 3.02 | Ins. | 3.31 | Ins. | 3.66 | 52.22 | 35.10 | 32 | | |
| Canton, N. Y. | Ins. | 2.50 | Ins. | 3.31 | Ins. | 2.27 | Ins. | 1.67 | Ins. | 3.08 | Ins. | 3.09 | Ins. | 2.53 | Ins. | 3.94 | Ins. | 3.65 | Ins. | 3.23 | Ins. | 3.51 | Ins. | 3.09 | Ins. | 3.23 | 3.04 | 24.35 | 12.37 | 12 | |
| Pittsburgh, Pa. | Ins. | 3.31 | Ins. | 3.06 | Ins. | 3.62 | Ins. | 2.62 | Ins. | 3.68 | Ins. | 3.81 | Ins. | 3.43 | Ins. | 4.03 | Ins. | 3.73 | Ins. | 2.79 | Ins. | 2.58 | Ins. | 2.72 | Ins. | 3.08 | 3.04 | 24.35 | 12.37 | 12 | |
| Pittsburgh, Pa. | Ins. | 3.05 | Ins. | 3.33 | Ins. | 2.62 | Ins. | 2.62 | Ins. | 3.33 | Ins. | 3.81 | Ins. | 3.43 | Ins. | 4.03 | Ins. | 3.73 | Ins. | 2.79 | Ins. | 2.58 | Ins. | 2.72 | Ins. | 3.08 | 3.04 | 24.35 | 12.37 | 12 | |
| Scranton, Pa. | Ins. | 3.48 | Ins. | 4.60 | Ins. | 3.58 | Ins. | 3.20 | Ins. | 3.27 | Ins. | 3.70 | Ins. | 3.66 | Ins. | 4.98 | Ins. | 3.41 | Ins. | 3.69 | Ins. | 3.24 | Ins. | 2.70 | Ins. | 2.62 | 2.40 | 38.17 | 36.4 | 26 | |
| Cincinnati, Ohio | Ins. | 3.03 | Ins. | 4.60 | Ins. | 3.58 | Ins. | 3.20 | Ins. | 3.27 | Ins. | 3.70 | Ins. | 3.66 | Ins. | 4.98 | Ins. | 3.41 | Ins. | 3.69 | Ins. | 3.24 | Ins. | 2.70 | Ins. | 2.62 | 2.40 | 38.17 | 36.4 | 26 | |
| Cleveland, Ohio | Ins. | 3.48 | Ins. | 4.60 | Ins. | 3.58 | Ins. | 3.20 | Ins. | 3.27 | Ins. | 3.70 | Ins. | 3.66 | Ins. | 4.98 | Ins. | 3.41 | Ins. | 3.69 | Ins. | 3.24 | Ins. | 2.70 | Ins. | 2.62 | 2.40 | 38.17 | 36.4 | 26 | |
| Evansville, Ind. | Ins. | 3.74 | Ins. | 4.61 | Ins. | 3.24 | Ins. | 3.26 | Ins. | 3.84 | Ins. | 3.62 | Ins. | 3.36 | Ins. | 3.40 | Ins. | 3.31 | Ins. | 2.78 | Ins. | 2.68 | Ins. | 2.85 | Ins. | 3.44 | 3.14 | 39.40 | 47.1 | 90 | |
| Indianapolis, Ind. | Ins. | 3.74 | Ins. | 4.61 | Ins. | 3.24 | Ins. | 3.26 | Ins. | 3.84 | Ins. | 3.62 | Ins. | 3.36 | Ins. | 3.40 | Ins. | 3.31 | Ins. | 2.78 | Ins. | 2.68 | Ins. | 2.85 | Ins. | 3.44 | 3.14 | 39.40 | 47.1 | 90 | |
| Indianapolis, Ind. | Ins. | 2.95 | Ins. | 4.74 | Ins. | 2.73 | Ins. | 1.47 | Ins. | 3.85 | Ins. | 3.67 | Ins. | 3.30 | Ins. | 3.60 | Ins. | 3.46 | Ins. | 2.93 | Ins. | 2.63 | Ins. | 2.76 | Ins. | 2.58 | 2.58 | 54.14 | 39.40 | 47.1 | 90 |
| Fort Wayne, Ind. | Ins. | 2.95 | Ins. | 4.74 | Ins. | 2.73 | Ins. | 1.47 | Ins. | 3.85 | Ins. | 3.67 | Ins. | 3.30 | Ins. | 3.60 | Ins. | 3.46 | Ins. | 2.93 | Ins. | 2.63 | Ins. | 2.76 | Ins. | 2.58 | 2.58 | 54.14 | 39.40 | 47.1 | 90 |
| Chicago, Ill. | Ins. | 2.33 | Ins. | 4.23 | Ins. | 2.35 | Ins. | 1.73 | Ins. | 3.54 | Ins. | 3.77 | Ins. | 3.44 | Ins. | 3.58 | Ins. | 3.03 | Ins. | 2.78 | Ins. | 2.62 | Ins. | 2.89 | Ins. | 3.03 | 1.64 | 32.36 | 22.97 | 36 | |
| Chicago, Ill. | Ins. | 1.90 | Ins. | 3.93 | Ins. | 2.01 | Ins. | 1.58 | Ins. | 2.73 | Ins. | 3.57 | Ins. | 3.38 | Ins. | 4.56 | Ins. | 3.03 | Ins. | 2.77 | Ins. | 2.68 | Ins. | 2.76 | Ins. | 2.51 | 1.04 | 32.36 | 22.97 | 36 | |
| Peoria, Ill. | Ins. | 1.78 | Ins. | 3.98 | Ins. | 2.04 | Ins. | 1.58 | Ins. | 2.73 | Ins. | 3.57 | Ins. | 3.38 | Ins. | 4.56 | Ins. | 3.03 | Ins. | 2.77 | Ins. | 2.68 | Ins. | 2.76 | Ins. | 2.51 | 1.04 | 32.36 | 22.97 | 36 | |
| Peoria, Ill. | Ins. | 1.78 | Ins. | 3.98 | Ins. | 2.04 | Ins. | 1.58 | Ins. | 2.73 | Ins. | 3.57 | Ins. | 3.38 | Ins. | 4.56 | Ins. | 3.03 | Ins. | 2.77 | Ins. | 2.68 | Ins. | 2.76 | Ins. | 2.51 | 1.04 | 32.36 | 22.97 | 36 | |
| Grand Rapids, Mich. | Ins. | 2.35 | Ins. | 4.98 | Ins. | 2.13 | Ins. | 2.44 | Ins. | 3.66 | Ins. | 3.46 | Ins. | 3.05 | Ins. | 3.71 | Ins. | 3.59 | Ins. | 2.80 | Ins. | 2.63 | Ins. | 2.80 | Ins. | 2.57 | 1.29 | 50.34 | 39.36 | 66 | |
| Grand Rapids, Mich. | Ins. | 2.35 | Ins. | 4.98 | Ins. | 2.13 | Ins. | 2.44 | Ins. | 3.66 | Ins. | 3.46 | Ins. | 3.05 | Ins. | 3.71 | Ins. | 3.59 | Ins. | 2.80 | Ins. | 2.63 | Ins. | 2.80 | Ins. | 2.57 | 1.29 | 50.34 | 39.36 | 66 | |
| Alpena, Mich. | Ins. | 1.89 | Ins. | 2.86 | Ins. | 1.71 | Ins. | 1.91 | Ins. | 1.16 | Ins. | 2.99 | Ins. | 2.66 | Ins. | 2.42 | Ins. | 3.05 | Ins. | 2.67 | Ins. | 2.44 | Ins. | 2.60 | Ins. | 2.51 | 1.29 | 50.34 | 39.36 | 66 | |
| Alpena, Mich. | Ins. | 1.89 | Ins. | 2.86 | Ins. | 1.71 | Ins. | 1.91 | Ins. | 1.16 | Ins. | 2.99 | Ins. | 2.66 | Ins. | 2.42 | Ins. | 3.05 | Ins. | 2.67 | Ins. | 2.44 | Ins. | 2.60 | Ins. | 2.51 | 1.29 | 50.34 | 39.36 | 66 | |
| Marquette, Mich. | Ins. | 2.33 | Ins. | 3.73 | Ins. | 1.90 | Ins. | 1.48 | Ins. | 2.07 | Ins. | 1.84 | Ins. | 2.43 | Ins. | 2.96 | Ins. | 2.59 | Ins. | 2.67 | Ins. | 2.44 | Ins. | 2.60 | Ins. | 2.51 | 1.29 | 50.34 | 39.36 | 66 | |
| Madison, W. Va. | Ins. | 1.38 | Ins. | 3.31 | Ins. | 1.54 | Ins. | 1.58 | Ins. | 2.04 | Ins. | 2.07 | Ins. | 2.65 | Ins. | 3.47 | Ins. | 3.85 | Ins. | 3.13 | Ins. | 2.76 | Ins. | 3.76 | Ins. | 3.40 | 1.04 | 32.36 | 22.97 | 36 | |
| Madison, W. Va. | Ins. | 1.38 | Ins. | 3.31 | Ins. | 1.54 | Ins. | 1.58 | Ins. | 2.04 | Ins. | 2.07 | Ins. | 2.65 | Ins. | 3.47 | Ins. | 3.85 | Ins. | 3.13 | Ins. | 2.76 | Ins. | 3.76 | Ins. | 3.40 | 1.04 | 32.36 | 22.97 | 36 | |
| Green Bay, Wis. | Ins. | 1.54 | Ins. | 2.94 | Ins. | 1.56 | Ins. | 1.38 | Ins. | 2.04 | Ins. | 2.77 | Ins. | 4.33 | Ins. | 3.25 | Ins. | 3.52 | Ins. | 3.13 | Ins. | 2.76 | Ins. | 3.76 | Ins. | 3.40 | 1.04 | 32.36 | 22.97 | 36 | |
| Green Bay, Wis. | Ins. | 1.54 | Ins. | 2.94 | Ins. | 1.56 | Ins. | 1.38 | Ins. | 2.04 | Ins. | 2.77 | Ins. | 4.33 | Ins. | 3.25 | Ins. | 3.52 | Ins. | 3.13 | Ins. | 2.76 | Ins. | 3.76 | Ins. | 3.40 | 1.04 | 32.36 | 22.97 | 36 | |
| Duluth, Minn. | Ins. | 1.54 | Ins. | 2.94 | Ins. | 1.56 | Ins. | 1.38 | Ins. | 2.04 | Ins. | 2.77 | Ins. | 4.33 | Ins. | 3.25 | Ins. | 3.52 | Ins. | 3.13 | Ins. | 2.76 | Ins. | 3.76 | Ins. | 3.40 | 1.04 | 32.36 | 22.97 | 36 | |
| Duluth, Minn. | Ins. | 1.54 | Ins. | 2.94 | Ins. | 1.56 | Ins. | 1.38 | Ins. | 2.04 | Ins. | 2.77 | Ins. | 4.33 | Ins. | 3.25 | Ins. | 3.52 | Ins. | 3.13 | Ins. | 2.76 | Ins. | 3.76 | Ins. | 3.40 | 1.04 | 32.36 | 22.97 | 36 | |
| St. Paul, Minn. | Ins. | 1.54 | Ins. | 2.94 | Ins. | 1.56 | Ins. | 1.38 | Ins. | 2.04 | Ins. | 2.77 | Ins. | 4.33 | Ins. | 3.25 | Ins. | 3.52 | Ins. | 3.13 | Ins. | 2.76 | Ins. | 3.76 | Ins. | 3.40 | 1.04 | 32.36 | 22.97 | 36 | |
| St. Paul, Minn. | Ins. | 1.54 | Ins. | 2.94 | Ins. | 1.56 | Ins. | 1.38 | Ins. | 2.04 | Ins. | 2.77 | Ins. | 4.33 | Ins. | 3.25 | Ins. | 3.52 | Ins. | 3.13 | Ins. | 2.76 | Ins. | 3.76 | Ins. | 3.40 | 1.04 | 32.36 | 22.97 | 36 | |
| Des Moines, Iowa. | Ins. | 1.07 | Ins. | 2.17 | Ins. | 1.52 | Ins. | 1.92 | Ins. | 1.95 | Ins. | 1.43 | Ins. | 2.29 | Ins. | 2.91 | Ins. | 4.38 | Ins. | 3.47 | Ins. | 2.48 | Ins. | 2.90 | Ins. | 2.57 | 1.55 | 30.17 | 28.30 | 22 | |
| Des Moines, Iowa. | Ins. | 1.07 | Ins. | 2.17 | Ins. | 1.52 | Ins. | 1.92 | Ins. | 1.95 | Ins. | 1.43 | Ins. | 2.29 | Ins. | 2.91 | Ins. | 4.38 | Ins. | 3.47 | Ins. | 2.48 | Ins. | 2.90 | Ins. | 2.57 | 1.55 | 30.17 | 28.30 | 22 | |
| Dubuque, Iowa. | Ins. | 1.30 | Ins. | 3.13 | Ins. | 1.58 | Ins. | 2.03 | Ins. | 2.03 | Ins. | 2.03 | Ins. | 2.41 | Ins. | 2.85 | Ins. | 3.47 | Ins. | 3.47 | Ins. | 2.48 | Ins. | 2.90 | Ins. | 2.57 | 1.55 | 30.17 | 28.30 | 22 | |
| Dubuque, Iowa. | Ins. | 1.30 | Ins. | 3.13 | Ins. | 1.58 | Ins. | 2.03 | Ins. | 2.03 | Ins. | 2.03 | Ins. | 2.41 | Ins. | 2.85 | Ins. | 3.47 | Ins. | 3.47 | Ins. | 2.48 | Ins. | 2.90 | Ins. | 2.57 | 1.55 | 30.17 | 28.30 | 22 | |
| St. Louis, Mo. | Ins. | 2.34 | Ins. | 2.11 | Ins. | 2.56 | Ins. | 1.98 | Ins. | 3.38 | Ins. | 3.38 | Ins. | 3.33 | Ins. | 3.81 | Ins. | 6.99 | Ins. | 4.34 | Ins. | 3.72 | Ins. | 3.68 | Ins. | 3.50 | 2.72 | 34.32 | 30.24 | 36 | |
| St. Louis, Mo. | Ins. | 2.34 | Ins. | 2.11 | Ins. | 2.56 | Ins. | 1.98 | Ins. | 3.38 | Ins. | 3.38 | Ins. | 3.33 | Ins. | 3.81 | Ins. | 6.99 | Ins. | 4.34 | Ins. | 3.72 | Ins. | 3.68 | Ins. | 3.50 | 2.72 | 34.32 | 30.24 | 36 | |
| St. Joseph, Mo. | Ins. | 1.05 | Ins. | 2.96 | Ins. | 1.57 | Ins. | 2.04 | Ins. | 2.04 | Ins. | 1.99 | Ins. | 3.02 | Ins. | 3.86 | Ins. | 5.19 | Ins. | 3.27 | Ins. | 3.37 | Ins. | 3.35 | Ins. | 2.97 | 1.83 | 19.33 | 01.38 | 36 | |
| St. Joseph, Mo. | Ins. | 1.05 | Ins. | 2.96 | Ins. | 1.57 | Ins. | 2.04 | Ins. | 2.04 | Ins. | 1.99 | Ins. | 3.02 | Ins. | 3.86 | Ins. | 5.19 | Ins. | 3.27 | Ins. | 3.37 | Ins. | 3.35 | Ins. | 2.97 | 1.83 | 19.33 | 01.38 | 36 | |
| Springfield, Mo. | Ins. | 2.34 | Ins. | 2.53 | Ins. | 2.35 | Ins. | 1.55 | Ins. | 3.39 | Ins. | 3.39 | Ins. | 3.33 | Ins. | 3.81 | Ins. | 6.99 | Ins. | 4.34 | Ins. | 3.72 | Ins. | 3.68 | Ins. | 3.50 | 2.72 | 34.32 | 30.24 | 36 | |
| Springfield, Mo. | Ins. | 2.34 | Ins. | 2.53 | Ins. | 2.35 | Ins. | 1.55 | Ins. | 3.39 | Ins. | 3.39 | Ins. | 3.33 | Ins. | 3.81 | Ins. | 6.99 | Ins. | 4.34 | Ins. | 3.72 | Ins. | 3.68 | Ins. | 3.50 | 2.72 | 34.32 | 30.24 | 36 | |
| Bismarck, N. Dak. | Ins. | 4.45 | Ins. | 69 | Ins. | 44 | Ins. | 32 | Ins. | 17 | Ins. | 76 | Ins. | 1.52 | Ins. | 1.54 | Ins. | 1.27 | Ins. | 2.32 | Ins. | 2.17 | Ins. | 1.87 | Ins. | 1.21 | 2.31 | 61.41 | 78.40 | 15 | |
| Bismarck, N. Dak. | Ins. | 4.45 | Ins. | 69 | Ins. | 44 | Ins. | 32 | Ins. | 17 | Ins. | 76 | Ins. | 1.52 | Ins. | 1.54 | Ins. | 1.27 | Ins. | 2.32 | Ins. | 2.17 | Ins. | 1.87 | Ins. | 1.21 | 2.31 | 61.41 | 78.40 | 15 | |
| Devils Lake, N. Dak. | Ins. | 4.47 | Ins. | 41 | Ins. | 46 | Ins. | 59 | Ins. | 86 | Ins. | 76 | Ins. | 1.52 | Ins. | 1.54 | Ins. | 1.27 | Ins. | 2.32 | Ins. | 2.17 | Ins. | 1.87 | Ins. | 1.21 | 2.31 | 61.41 | 78.40 | 15 | |
| Devils Lake, N. Dak. | Ins. | 4.47 | Ins. | 41 | Ins. | 46 | Ins. | 59 | Ins. | 86 | Ins. | 76 | Ins. | 1.52 | Ins. | 1.54 | Ins. | 1.27 | Ins. | 2.32 | Ins. | 2.17 | Ins. | 1.87 | Ins. | 1.21 | 2.31 | 61.41 | 78.40 | 15 | |
| Pierre, S. Dak. | Ins. | 4.47 | Ins. | 41 | Ins. | 46 | Ins. | 59 | Ins. | 86 | Ins. | 76 | Ins. | 1.52 | Ins. | 1.54 | Ins. | 1.27 | Ins. | 2.32 | Ins. | 2.17 | Ins. | 1.87 | Ins. | 1.21 | 2.31 | 61.41 | 78.40 | 15 | |
| Pierre, S. Dak. | Ins. | 4.47 | Ins. | 41 | Ins. | 46 | Ins. | 59 | Ins. | 86 | Ins. | 76 | Ins. | 1.52 | Ins. | 1.54 | Ins. | 1.27 | Ins. | 2.32 | Ins. | 2.17 | Ins. | 1.87 | Ins. | 1.21 | 2.31 | 61.41 | 78.40 | 15 | |
| North Platte, Nebr. | Ins. | 39 | Ins. | 223 | Ins. | 53 | Ins. | 44 | Ins. | 20 | Ins. | 86 | Ins. | 26 | Ins. | 3.83 | Ins. | 3.77 | Ins. | 2.78 | Ins. | 2.49 | Ins. | 2.38 | Ins. | 2.05 | 1.57 | 58.50 | 70.15 | 81 | |
| North Platte, Nebr. | Ins. | 39 | Ins. | 223 | Ins | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|------|------|------|------|-------|-------|------|------|-------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|--------|-------|
| Parkersburg, W. Va. | 2.57 | 3.13 | 2.69 | 3.49 | 2.39 | 2.19 | 2.64 | 3.38 | 5.02 | 4.00 | 3.31 | 4.29 | 4.35 | 3.51 | 3.87 | 2.76 | 4.12 | 2.48 | 4.34 | 2.57 | 4.16 | 3.03 | 2.43 | 389.41 | 42.09 |
| Lexington, Ky. | 2.83 | 3.62 | 3.38 | 4.32 | 3.67 | 3.50 | 2.99 | 3.61 | 5.59 | 4.22 | 5.68 | 5.10 | 5.12 | 3.45 | 1.49 | 2.99 | 4.35 | 2.93 | 2.99 | 3.34 | 3.92 | 3.77 | 3.86 | 43.35 | 41.45 |
| Charlotte, N. C. | 2.58 | 4.17 | 3.57 | 4.17 | 2.79 | 3.31 | 2.99 | 3.63 | 5.90 | 4.22 | 6.28 | 5.10 | 5.12 | 3.45 | 1.49 | 2.99 | 4.35 | 2.93 | 2.99 | 3.34 | 3.92 | 3.77 | 3.86 | 43.35 | 41.45 |
| Wilmington, N. C. | 5.64 | 2.98 | 4.86 | 3.02 | 2.06 | 2.66 | 1.94 | 3.44 | 4.30 | 4.25 | 2.87 | 7.13 | 5.07 | 6.36 | 7.80 | 4.41 | 5.16 | 5.36 | 5.22 | 5.81 | 1.96 | 1.63 | 2.79 | 3.54 | 93.83 |
| Charleston, S. C. | 6.66 | 2.98 | 4.86 | 3.02 | 2.06 | 2.66 | 1.94 | 3.44 | 4.30 | 4.25 | 2.87 | 7.13 | 5.07 | 6.36 | 7.80 | 4.41 | 5.16 | 5.36 | 5.22 | 5.81 | 1.96 | 1.63 | 2.79 | 3.54 | 93.83 |
| Greenville, S. C. | 3.82 | 5.19 | 9.21 | 5.16 | 13.03 | 2.81 | 0.16 | 4.03 | 3.66 | 4.55 | 2.97 | 5.36 | 1.62 | 5.25 | 1.35 | 3.68 | 12.95 | 2.12 | 2.94 | 3.03 | 5.26 | 4.84 | 3.44 | 53.19 | 66.81 |
| Atlanta, Ga. | 4.22 | 4.79 | 9.21 | 4.09 | 5.48 | 3.34 | 0.40 | 3.67 | 3.92 | 4.55 | 6.10 | 6.70 | 5.54 | 3.14 | 1.35 | 3.68 | 12.95 | 2.12 | 2.94 | 3.03 | 5.26 | 4.84 | 3.44 | 53.19 | 66.81 |
| Thomasville, Ga. | 4.93 | 4.46 | 3.71 | 2.88 | 2.91 | 2.44 | 3.38 | 4.02 | 6.09 | 5.33 | 4.60 | 6.70 | 5.54 | 3.14 | 1.35 | 3.68 | 12.95 | 2.12 | 2.94 | 3.03 | 5.26 | 4.84 | 3.44 | 53.19 | 66.81 |
| Jacksonville, Fla. | 3.96 | 2.97 | 1.28 | 4.22 | 2.91 | 2.44 | 3.38 | 4.02 | 6.09 | 5.33 | 4.60 | 6.70 | 5.54 | 3.14 | 1.35 | 3.68 | 12.95 | 2.12 | 2.94 | 3.03 | 5.26 | 4.84 | 3.44 | 53.19 | 66.81 |
| Miami, Fla. | 1.83 | 3.44 | 3.48 | 4.22 | 2.91 | 2.44 | 3.38 | 4.02 | 6.09 | 5.33 | 4.60 | 6.70 | 5.54 | 3.14 | 1.35 | 3.68 | 12.95 | 2.12 | 2.94 | 3.03 | 5.26 | 4.84 | 3.44 | 53.19 | 66.81 |
| Memphis, Tenn. | 3.95 | 4.16 | 3.81 | 4.58 | 3.26 | 3.63 | 4.78 | 5.08 | 3.95 | 6.46 | 4.40 | 6.42 | 9.36 | 7.37 | 6.51 | 6.02 | 7.85 | 6.38 | 4.46 | 2.48 | 1.88 | 1.73 | 3.21 | 62.92 | 74.60 |
| Nashville, Tenn. | 3.85 | 4.16 | 3.81 | 4.58 | 3.26 | 3.63 | 4.78 | 5.08 | 3.95 | 6.46 | 4.40 | 6.42 | 9.36 | 7.37 | 6.51 | 6.02 | 7.85 | 6.38 | 4.46 | 2.48 | 1.88 | 1.73 | 3.21 | 62.92 | 74.60 |
| Birmingham, Ala. | 5.69 | 5.03 | 6.33 | 5.16 | 13.14 | 4.81 | 3.93 | 3.95 | 10.20 | 4.46 | 4.02 | 6.42 | 9.36 | 7.37 | 6.51 | 6.02 | 7.85 | 6.38 | 4.46 | 2.48 | 1.88 | 1.73 | 3.21 | 62.92 | 74.60 |
| Birmingham, Ala. | 5.69 | 5.03 | 6.33 | 5.16 | 13.14 | 4.81 | 3.93 | 3.95 | 10.20 | 4.46 | 4.02 | 6.42 | 9.36 | 7.37 | 6.51 | 6.02 | 7.85 | 6.38 | 4.46 | 2.48 | 1.88 | 1.73 | 3.21 | 62.92 | 74.60 |
| Mobile, Ala. | 5.69 | 5.03 | 6.33 | 5.16 | 13.14 | 4.81 | 3.93 | 3.95 | 10.20 | 4.46 | 4.02 | 6.42 | 9.36 | 7.37 | 6.51 | 6.02 | 7.85 | 6.38 | 4.46 | 2.48 | 1.88 | 1.73 | 3.21 | 62.92 | 74.60 |
| Meridian, Miss. | 6.44 | 5.45 | 5.75 | 6.23 | 13.70 | 4.78 | 2.72 | 4.32 | 5.35 | 5.35 | 5.38 | 4.89 | 2.12 | 3.44 | 1.35 | 3.68 | 12.95 | 2.12 | 2.94 | 3.03 | 5.26 | 4.84 | 3.44 | 53.19 | 66.81 |
| Vicksburg, Miss. | 4.82 | 6.44 | 5.45 | 5.75 | 6.23 | 13.70 | 4.78 | 2.72 | 4.32 | 5.35 | 5.38 | 4.89 | 2.12 | 3.44 | 1.35 | 3.68 | 12.95 | 2.12 | 2.94 | 3.03 | 5.26 | 4.84 | 3.44 | 53.19 | 66.81 |
| New Orleans, La. | 4.82 | 6.44 | 5.45 | 5.75 | 6.23 | 13.70 | 4.78 | 2.72 | 4.32 | 5.35 | 5.38 | 4.89 | 2.12 | 3.44 | 1.35 | 3.68 | 12.95 | 2.12 | 2.94 | 3.03 | 5.26 | 4.84 | 3.44 | 53.19 | 66.81 |
| Shreveport, La. | 3.29 | 3.29 | 2.54 | 4.11 | 3.64 | 6.63 | 3.09 | 4.22 | 3.36 | 3.50 | 3.98 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Amarillo, Tex. | 1.16 | 1.71 | 3.4 | 1.71 | 1.84 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Brownsville, Tex. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| El Paso, Tex. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Fort Worth, Tex. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Salveston, Tex. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| San Antonio, Tex. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Oklahoma City, Okla. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Little Rock, Ark. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Hayes, Mont. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Miles City, Mont. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Kalspell, Mont. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Cheyenne, Wyo. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Sheridan, Wyo. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Pueblo, Colo. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Grand Junction, Colo. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Santa Fe, N. Mex. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Roswell, N. Mex. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Phoenix, Ariz. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Modena, Utah | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Salt Lake City, Utah | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Winnemucca, Nev. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Boise, Idaho | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Seattle, Wash. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Walla Walla, Wash. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Portland, Ore. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Roseburg, Ore. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Eureka, Calif. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Fresno, Calif. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| Los Angeles, Calif. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| San Diego, Calif. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |
| San Francisco, Calif. | 1.46 | 1.21 | 2.27 | 1.26 | 1.36 | 1.83 | 1.88 | 2.74 | 8.60 | 2.84 | 1.54 | 3.54 | 3.16 | 5.80 | 2.70 | 5.03 | 16.57 | 5.30 | 6.26 | 3.85 | 1.99 | 4.20 | 6.25 | 37.35 | 85.08 |

1 Normals are based on records of 20 or more years of observations.

T. = Trace, indicates an amount too small to measure.</

TABLE 599.—*Frost: Dates of killing frosts, with length of growing season*

| Station | Date of last killing frost in spring, 1929 | Date of first killing frost in fall, 1929 | Averages and extremes for 30 to 50 years | | | | Length of growing season between average dates of killing frosts |
|----------------------|--|---|--|------------------------------------|--------------------------------|-------------------------------------|--|
| | | | Spring frosts | | Fall frosts | | |
| | | | Latest date of killing frost | Average date of last killing frost | Earliest date of killing frost | Average date of first killing frost | |
| Greenville, Me. | May 23 ¹ | Sept. 21 ¹ | June 23 | May 30 | Aug. 26 | Sept. 14 | Days 107 |
| Portland, Me. | Apr. 15 ¹ | Oct. 9 | June 20 | May 14 | Sept. 11 | Oct. 18 | 157 |
| Concord, N. H. | May 10 ¹ | Sept. 20 | June 5 | May 7 | Sept. 6 | Sept. 30 | 146 |
| Northfield, Vt. | May 23 ¹ | do. | June 20 | May 22 | Aug. 27 | Sept. 18 | 120 |
| Boston, Mass. | Apr. 14 | Nov. 22 | May 16 | Apr. 14 | Sept. 26 | Oct. 24 | 193 |
| Hartford, Conn. | do. ¹ | Oct. 10 | May 22 | Apr. 23 | Sept. 16 | Oct. 13 | 173 |
| Albany, N. Y. | Apr. 11 | do. | May 30 | do. | Sept. 15 | Oct. 16 | 176 |
| Buffalo, N. Y. | Apr. 19 | do. | May 21 | Apr. 28 | Oct. 3 | Oct. 21 | 176 |
| Canton, N. Y. | Apr. 29 ¹ | Sept. 19 | June 2 | May 8 | Sept. 11 | Sept. 28 | 143 |
| Setauket, N. Y. | Apr. 2 ¹ | do. | May 17 | Apr. 16 | Oct. 22 | Nov. 10 | 208 |
| Syracuse, N. Y. | Apr. 11 ¹ | Sept. 21 | May 5 | Apr. 24 | Sept. 21 | Oct. 22 | 181 |
| Atlantic City, N. J. | Mar. 18 ¹ | Nov. 25 | Apr. 30 | Apr. 11 | Oct. 1 | Nov. 5 | 208 |
| Trenton, N. J. | do. ¹ | Oct. 11 | May 17 | Apr. 20 | Sept. 22 | Oct. 19 | 182 |
| Erie, Pa. | Apr. 2 ¹ | Oct. 10 | do. | do. | Oct. 9 | Nov. 2 | 195 |
| Harrisburg, Pa. | Mar. 17 | Oct. 11 | May 12 | Apr. 10 | Oct. 3 | Oct. 27 | 200 |
| Pittsburgh, Pa. | Apr. 19 | Sept. 19 | May 29 | Apr. 21 | Sept. 19 | Oct. 22 | 184 |
| Scranton, Pa. | May 10 | Oct. 9 | May 10 | Apr. 20 | Sept. 14 | Oct. 13 | 176 |
| Cincinnati, Ohio. | Mar. 17 ¹ | Nov. 5 | Apr. 26 | Apr. 14 | Sept. 30 | Oct. 25 | 194 |
| Cleveland, Ohio. | Apr. 21 | Nov. 20 | May 21 | Apr. 15 | Oct. 2 | Nov. 2 | 201 |
| Columbus, Ohio. | Apr. 19 | Nov. 5 | May 17 | Apr. 17 | Sept. 21 | Oct. 18 | 184 |
| Dayton, Ohio. | do. | do. | May 11 | Apr. 15 | Oct. 9 | Oct. 27 | 195 |
| Toledo, Ohio. | Apr. 18 | Nov. 5 | May 29 | Apr. 22 | Sept. 9 | Oct. 18 | 179 |
| Evansville, Ind. | Mar. 10 | do. | Apr. 26 | Apr. 6 | Sept. 30 | Oct. 27 | 204 |
| Fort Wayne, Ind. | Apr. 19 | Sept. 19 | May 28 | Apr. 25 | Sept. 14 | Oct. 13 | 171 |
| Indianapolis, Ind. | Apr. 1 ¹ | Nov. 5 | May 25 | Apr. 16 | Sept. 21 | Oct. 19 | 186 |
| Cairo, Ill. | Mar. 10 | do. | Apr. 30 | Mar. 31 | Sept. 30 | Oct. 29 | 212 |
| Chicago, Ill. | Apr. 1 ¹ | do. | May 23 | Apr. 18 | Sept. 20 | Oct. 18 | 183 |
| Peoria, Ill. | Apr. 1 ¹ | Oct. 25 | May 11 | Apr. 15 | Sept. 28 | Oct. 19 | 187 |
| Springfield, Ill. | do. | do. | May 25 | do. | Sept. 25 | do. | 187 |
| Alpena, Mich. | May 9 | Sept. 19 | June 9 | May 13 | Sept. 6 | Sept. 30 | 140 |
| Detroit, Mich. | Apr. 18 ¹ | Nov. 5 | May 31 | Apr. 30 | Sept. 21 | Oct. 14 | 167 |
| Grand Haven, Mich. | Apr. 19 | Oct. 28 | May 28 | May 1 | Sept. 23 | Oct. 17 | 169 |
| Grand Rapids, Mich. | May 2 | Oct. 5 | do. | Apr. 28 | do. | do. | 172 |
| Ludington, Mich. | Apr. 19 | Oct. 9 | June 17 | May 2 | Sept. 4 | Oct. 21 | 173 |
| Marquette, Mich. | May 18 | Oct. 4 | June 6 | May 13 | Aug. 23 | Oct. 9 | 149 |
| Green Bay, Wis. | May 19 | Sept. 18 | May 30 | May 5 | Sept. 16 | do. | 157 |
| La Crosse, Wis. | do. | do. | May 24 | Apr. 28 | Sept. 10 | Oct. 10 | 165 |
| Madison, Wis. | do. | Nov. 2 | May 25 | Apr. 25 | Sept. 16 | Oct. 17 | 175 |
| Milwaukee, Wis. | Apr. 21 ¹ | Nov. 5 | May 29 | Apr. 28 | Sept. 25 | Oct. 16 | 171 |
| Duluth, Minn. | May 18 ¹ | Sept. 18 | June 14 | May 7 | Sept. 10 | Oct. 4 | 150 |
| Minneapolis, Minn. | May 3 | do. | May 20 | Apr. 26 | Sept. 13 | Oct. 10 | 167 |
| Moorhead, Minn. | May 20 | do. | June 8 | May 13 | Aug. 25 | Sept. 24 | 134 |
| Charles City, Iowa. | May 9 | do. | May 21 | Apr. 30 | Sept. 12 | Oct. 7 | 160 |
| Des Moines, Iowa. | Apr. 13 | Oct. 25 | May 31 | Apr. 21 | Sept. 13 | Oct. 10 | 172 |
| Dubuque, Iowa. | Apr. 1 ¹ | Oct. 23 | May 21 | Apr. 20 | Sept. 21 | Oct. 15 | 178 |
| Keokuk, Iowa. | Apr. 1 | Nov. 9 | May 4 | Apr. 14 | Sept. 18 | Oct. 13 | 182 |
| Columbia, Mo. | Mar. 10 ¹ | Oct. 25 | May 9 | Apr. 12 | do. | Oct. 14 | 185 |
| St. Joseph, Mo. | Apr. 12 | Nov. 4 | Apr. 28 | Apr. 11 | Sept. 26 | do. | 186 |
| St. Louis, Mo. | Mar. 10 ¹ | Nov. 5 | May 22 | Apr. 4 | Sept. 30 | Oct. 28 | 207 |
| Springfield, Mo. | May 2 ¹ | Oct. 25 | May 19 | Apr. 14 | do. | Oct. 21 | 190 |
| Bismarck, N. Dak. | May 20 | Sept. 18 | June 7 | May 11 | Aug. 23 | Sept. 20 | 132 |
| Devils Lake, N. Dak. | May 23 | Sept. 17 | do. | May 16 | Aug. 8 | Sept. 19 | 126 |
| Williston, N. Dak. | May 15 ¹ | Sept. 8 | June 16 | May 15 | Aug. 22 | Sept. 20 | 128 |
| Huron, S. Dak. | May 16 | Oct. 21 | June 21 | May 10 | Aug. 23 | Sept. 23 | 136 |
| Pierre, S. Dak. | do. | Oct. 24 | May 19 | Apr. 30 | Sept. 12 | Oct. 5 | 156 |
| Rapid City, S. Dak. | May 8 ¹ | do. | May 21 | May 4 | Sept. 13 | Sept. 29 | 148 |
| Yankton, S. Dak. | May 16 | Oct. 21 | May 27 | May 1 | Sept. 14 | Oct. 6 | 156 |
| North Platte, Nebr. | May 2 | Oct. 23 | May 24 | do. | Sept. 10 | Sept. 30 | 152 |
| Omaha, Nebr. | Apr. 1 ¹ | do. | May 19 | Apr. 16 | Sept. 18 | Oct. 13 | 181 |
| Valentine, Nebr. | May 2 | Oct. 24 | June 21 | May 6 | Sept. 12 | Oct. 1 | 148 |
| Concordia, Kans. | Apr. 12 | Nov. 1 | May 19 | Apr. 17 | Sept. 20 | Oct. 17 | 182 |
| Dodge City, Kans. | Apr. 11 ¹ | Oct. 25 | May 27 | Apr. 21 | Sept. 23 | Oct. 21 | 183 |
| Iola, Kans. | Apr. 1 | do. | May 4 | Apr. 7 | Sept. 26 | Oct. 23 | 199 |
| Wichita, Kans. | do. | do. | May 15 | Apr. 10 | Sept. 23 | Oct. 25 | 198 |
| Washington, D. C. | Mar. 10 ¹ | Nov. 10 | May 12 | Apr. 8 | Oct. 2 | Oct. 20 | 195 |
| Lynchburg, Va. | Mar. 11 ¹ | do. | May 7 | Apr. 28 | do. | Oct. 27 | 182 |
| Norfolk, Va. | Mar. 11 | Nov. 30 | Apr. 26 | Mar. 25 | Oct. 11 | Nov. 17 | 237 |
| Richmond, Va. | Mar. 10 | Nov. 22 | do. | Apr. 7 | Oct. 12 | Oct. 31 | 207 |
| Wytheville, Va. | Apr. 23 | Nov. 6 | May 15 | Apr. 15 | Sept. 19 | Oct. 13 | 181 |
| Elkins, W. Va. | do. | Oct. 9 | May 26 | May 8 | Sept. 20 | Oct. 8 | 153 |
| Parkersburg, W. Va. | Apr. 19 | Oct. 18 | May 22 | Apr. 16 | Oct. 1 | Oct. 16 | 183 |
| Asheville, N. C. | Apr. 18 | Nov. 5 | May 10 | Apr. 15 | Oct. 3 | Oct. 20 | 186 |
| Charlotte, N. C. | Mar. 11 | Nov. 30 | Apr. 26 | Mar. 28 | Oct. 8 | Nov. 5 | 222 |
| Raleigh, N. C. | Mar. 10 | Nov. 22 | do. | Mar. 29 | do. | do. | 221 |
| Wilmington, N. C. | Mar. 11 ¹ | Nov. 30 | May 1 | Mar. 23 | Oct. 16 | Nov. 13 | 235 |
| Charleston, S. C. | Feb. 14 ¹ | do. | Apr. 2 | Feb. 20 | Nov. 8 | Dec. 10 | 208 |

¹ Temperature 32° F. or below.

TABLE 599.—*Frost: Dates of killing frosts, with length of growing season—Contd*

| Station | Date of last killing frost in spring, 1929 | Date of first killing frost in fall, 1929 | Averages and extremes for 30 to 50 years | | | | Length of growing season between average dates of killing frosts |
|------------------------|--|---|--|------------------------------------|--------------------------------|-------------------------------------|--|
| | | | Spring frosts | | Fall frosts | | |
| | | | Latest date of killing frost | Average date of last killing frost | Earliest date of killing frost | Average date of first killing frost | |
| Columbia, S. C. | Mar. 10 | Nov. 30 | Apr. 17 | Mar. 18 | Oct. 30 | Nov. 18 | Days 245 |
| Greenville, S. C. | Mar. 10 | Nov. 22 | Apr. 24 | Apr. 3 | Oct. 10 | Nov. 2 | 213 |
| Atlanta, Ga. | Mar. 18 | Nov. 29 | Apr. 17 | Mar. 31 | Oct. 11 | Nov. 7 | 221 |
| Augusta, Ga. | Feb. 14 ¹ | Nov. 30 | do. | Mar. 22 | Oct. 21 | Nov. 10 | 233 |
| Macon, Ga. | Feb. 23 | do. | Apr. 18 | Mar. 23 | Oct. 11 | Nov. 7 | 229 |
| Savannah, Ga. | Feb. 2 | do. | Apr. 13 | Feb. 26 | Oct. 25 | Nov. 24 | 271 |
| Thomasville, Ga. | Feb. 12 | do. | Apr. 26 | Mar. 14 | Oct. 21 | Nov. 15 | 246 |
| Apalachicola, Fla. | Jan. 7 | Nov. 20 | Mar. 23 | Feb. 14 | Nov. 13 | Dec. 7 | 296 |
| Avon Park, Fla. | None. | do. | Feb. 25 | Jan. 12 | Nov. 14 | Dec. 26 | 348 |
| Jacksonville, Fla. | do. | Nov. 30 | Apr. 10 | Feb. 16 | Nov. 12 | Dec. 6 | 293 |
| Miami, Fla. | do. | None. | Feb. 19 | (?) | Dec. 26 | (?) | (?) |
| Tampa, Fla. | do. | do. | Apr. 7 | Jan. 26 | Nov. 21 | Jan. 3 ¹ | 342 |
| Chattanooga, Tenn. | Mar. 10 ¹ | Nov. 21 | May 14 | Apr. 2 | Sept. 30 | Oct. 26 | 207 |
| Knoxville, Tenn. | Mar. 18 | Nov. 6 | Apr. 26 | do. | Oct. 1 | Oct. 28 | 209 |
| Memphis, Tenn. | Mar. 10 | do. | Apr. 25 | Mar. 22 | Oct. 2 | Nov. 3 | 226 |
| Nashville, Tenn. | do. | do. | Apr. 24 | Apr. 2 | Oct. 8 | Oct. 27 | 208 |
| Birmingham, Ala. | do. | Nov. 30 | Apr. 20 | Mar. 16 | Oct. 21 | Nov. 9 | 238 |
| Mobile, Ala. | Feb. 12 | do. | Apr. 6 | Feb. 17 | Oct. 31 | Dec. 5 | 291 |
| Montgomery, Ala. | do ¹ | do. | Apr. 5 | Mar. 10 | Oct. 21 | Nov. 11 | 246 |
| New Orleans, La. | Feb. 12 | Nov. 23 | Mar. 27 | Jan. 25 | Nov. 11 | Dec. 16 | 325 |
| Shreveport, La. | Feb. 21 ¹ | Nov. 22 | Apr. 9 | Mar. 6 | Oct. 20 | Nov. 10 | 249 |
| Abilene, Tex. | Feb. 23 | Oct. 24 | Apr. 23 | Mar. 21 | Oct. 19 | do. | 234 |
| Amarillo, Tex. | Mar. 18 | do. | May 23 | Apr. 17 | Sept. 22 | Oct. 29 | 195 |
| Brownsville, Tex. | None. | Dec. 23 | Mar. 8 | Jan. 28 | Nov. 15 | Dec. 22 | 328 |
| Corpus Christi, Tex. | Feb. 11 | Dec. 22 | Mar. 19 | Jan. 21 | Nov. 29 | Dec. 28 | 341 |
| Del Rio, Tex. | Feb. 12 | Nov. 16 | Mar. 27 | Feb. 28 | Oct. 27 | Nov. 17 | 262 |
| El Paso, Tex. | Mar. 16 | Nov. 10 | Apr. 26 | Mar. 14 | do. | Nov. 15 | 246 |
| Fort Worth, Tex. | Feb. 22 ¹ | Nov. 21 | Apr. 9 | Mar. 11 | Oct. 22 | Nov. 12 | 246 |
| Galveston, Tex. | Feb. 11 ¹ | None. | Mar. 1 | Jan. 19 | Nov. 16 | Dec. 26 | 341 |
| Palestine, Tex. | Feb. 23 ¹ | Nov. 22 | Apr. 5 | Mar. 13 | Oct. 20 | Nov. 13 | 245 |
| San Antonio, Tex. | Feb. 12 | Nov. 23 | do. | Feb. 24 | Oct. 30 | Nov. 28 | 277 |
| Taylor, Tex. | Mar. 21 | do. | do. | Mar. 13 | do. | Nov. 22 | 254 |
| Oklahoma City, Okla. | Mar. 1 | Nov. 19 | Apr. 30 | Mar. 31 | Oct. 7 | Nov. 2 | 216 |
| Fort Smith, Ark. | Mar. 10 | Nov. 5 | Apr. 17 | Mar. 21 | Oct. 9 | Nov. 6 | 230 |
| Little Rock, Ark. | do. | do. | Apr. 26 | Mar. 18 | Oct. 22 | Nov. 14 | 241 |
| Havre, Mont. | May 18 | Sept. 6 | June 6 | May 16 | Aug. 25 | Sept. 19 | 126 |
| Helena, Mont. | May 15 | Oct. 11 | June 9 | May 9 | do. | Sept. 28 | 142 |
| Kalispell, Mont. | do. | Sept. 6 | June 7 | May 5 | Sept. 6 | Oct. 2 | 150 |
| Miles City, Mont. | May 6 | Oct. 23 | May 31 | do. | Sept. 7 | do. | 150 |
| Cheyenne, Wyo. | May 12 | Oct. 22 | June 13 | May 20 | Aug. 25 | Sept. 19 | 122 |
| Lander, Wyo. | June 20 | Sept. 6 | June 18 | May 19 | Aug. 23 | Sept. 18 | 122 |
| Sheridan, Wyo. | May 29 | Sept. 9 | June 6 | May 20 | Aug. 25 | Sept. 20 | 123 |
| Yellowstone Park, Wyo. | do. | Sept. 4 | June 22 | May 21 | do. | Sept. 16 | 118 |
| Denver, Colo. | Apr. 26 | Oct. 22 | June 6 | May 4 | Sept. 12 | Oct. 8 | 157 |
| Grand Junction, Colo. | Apr. 11 | Oct. 23 | June 14 | Apr. 19 | Sept. 14 | Oct. 19 | 183 |
| Pueblo, Colo. | May 2 | Oct. 24 | June 2 | Apr. 27 | Sept. 12 | Oct. 8 | 164 |
| Roswell, N. Mex. | do. | do. | May 7 | Apr. 12 | Oct. 10 | Oct. 27 | 198 |
| Santa Fe, N. Mex. | do. | Oct. 23 | May 18 | Apr. 25 | Sept. 25 | Oct. 18 | 176 |
| Flagstaff, Ariz. | May 28 | do. | June 17 | May 31 | Sept. 12 | Sept. 24 | 116 |
| Phoenix, Ariz. | Feb. 10 | Nov. 14 | Mar. 31 | Feb. 16 | Nov. 5 | Dec. 3 | 290 |
| Tucson, Ariz. | Mar. 10 ¹ | do. | Apr. 6 | Mar. 11 | Oct. 22 | Nov. 9 | 243 |
| Yuma, Ariz. | Jan. 27 | None. | Feb. 18 | Jan. 2 | Nov. 30 | Dec. 25 | 357 |
| Modena, Utah. | June 21 | Oct. 24 | July 3 | May 23 | Sept. 5 | Sept. 26 | 126 |
| Salt Lake City, Utah. | Apr. 11 ¹ | Oct. 28 | June 18 | Apr. 20 | Sept. 22 | Oct. 20 | 183 |
| Reno, Nev. | June 2 | Oct. 3 | June 13 | May 13 | Sept. 6 | Oct. 3 | 143 |
| Winnemucca, Nev. | May 28 | Oct. 24 | June 22 | May 16 | Aug. 22 | Sept. 26 | 133 |
| Boise, Idaho. | Apr. 12 | Oct. 11 | June 16 | Apr. 27 | Sept. 11 | Oct. 12 | 168 |
| Lewiston, Idaho. | Apr. 2 | Oct. 25 | May 10 | Apr. 5 | Sept. 21 | Oct. 25 | 203 |
| Pocatello, Idaho. | May 6 | Sept. 8 | June 1 | May 1 | Sept. 8 | Oct. 6 | 158 |
| Seattle, Wash. | Mar. 14 | Nov. 11 | May 10 | Mar. 17 | Oct. 18 | Nov. 21 | 249 |
| Spokane, Wash. | Apr. 18 | Oct. 29 | June 8 | Apr. 14 | Sept. 7 | Oct. 13 | 182 |
| Walla Walla, Wash. | Apr. 1 | do. | Apr. 28 | Mar. 30 | Sept. 28 | Nov. 5 | 220 |
| Baker, Oreg. | May 10 | Sept. 21 | June 23 | May 8 | Aug. 30 | Sept. 30 | 145 |
| Portland, Oreg. | Feb. 18 ¹ | Nov. 13 | May 2 | Mar. 18 | Oct. 13 | Nov. 19 | 246 |
| Roseburg, Oreg. | Mar. 29 | Oct. 29 | May 24 | Apr. 14 | Sept. 24 | Nov. 12 | 212 |
| Eureka, Calif. | Feb. 8 | Nov. 21 | Apr. 7 | Feb. 8 | Nov. 11 | Nov. 26 | 291 |
| Fresno, Calif. | Apr. 7 | Nov. 13 | Apr. 14 | Feb. 22 | Oct. 31 | Dec. 2 | 283 |
| Independence, Calif. | Apr. 11 | Oct. 30 | May 24 | Apr. 6 | Sept. 24 | Oct. 28 | 205 |
| Los Angeles, Calif. | Feb. 9 | None. | Feb. 17 | (?) | Nov. 2 | (?) | (?) |
| Red Bluff, Calif. | Apr. 7 | do. | May 9 | Mar. 10 | Nov. 8 | Dec. 6 | 271 |
| Sacramento, Calif. | Apr. 9 | do. | May 7 | Feb. 19 | Nov. 11 | Nov. 29 | 293 |
| San Bernardino, Calif. | Mar. 25 ¹ | do. | Apr. 18 | Mar. 8 | Oct. 23 | Nov. 22 | 259 |
| San Diego, Calif. | None. | do. | Jan. 20 | (?) | Dec. 26 | (?) | (?) |
| San Francisco, Calif. | do. | do. | Mar. 27 | Jan. 25 | Dec. 4 | Dec. 10 | 319 |

Weather Bureau.

¹ Temperature 32° F. or below.² Frosts do not occur every year.³ Of year following.

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